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ABSTRACT

How can either private or public colleges and universities compete for students? Through what kinds of policies would they be most likely to encourage enrollment in their institutions? This study was designed to answer these questions, which have become relevant because of the near certainty that the majority of institutions will have a plethora of space and a shortage of applicants by 1985. To reflect the competitive strengths of different schools in both the private and public sector during the next ten years, postsecondary institutions were classified by selectivity and geographical recruitment areas. Various strategies for increasing enrollments are discussed and evaluated. The study concludes that the size of the private sector depends upon policies in the public sector. It is quite possible, with generous state funding, that public schools will maintain past levels of enrollment and impact enrollments in the private sector quite drastically. Private institutions will have no choice but to lower admission requirements to attract students who can afford to pay the high tuition fees they charge. The lesser private schools (except those catering to commuters, which presumably have the monopoly of location) will lose a considerable portion of their enrollment and may be forced to close. (Author/JMF)

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STUDY OF SUPPLY RESPONSE TO OVERSUPPLY OF COLLEGE PLACES

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Joseph Froomkin

EXECUTIVE SUMMARY

How can either private or public colleges and universities compete for students? Through what kinds of policies would they be most likely to encourage enrollment in their institutions? This study was designed to answer these questions, which have become relevant because of the near-certainty that the majority of institutions will have a plethora of space and a shortage of applicants during the next 10 years.

We have estimated that undergraduate enrollments will decline by some 10 per cent in the course of the next 10 years. Private post-secondary schools are likely to lose one-fifth of their students, while enrollments in the public sector decline five per cent. By 1985, private institutions are projected to have a plant large enough to accommodate roughly three times the number of students expected to be enrolled, while the capacity of the public schools exceeds enrollments by one-half.

The prospects of different schools in both the private and public sectors during the next ten years, as capacity exceeds the number of students, required a stratification of schools to reflect their competitive strengths. To highlight this position, post-secondary institutions were classified by (a) selectivity, and (b) geographical recruitment area. The selectivity of institutions was determined on the basis of the mean scores of enrolled freshmen in 1970. Five levels of selectivity

were assigned to each school, with lowest selectivity group comprising schools which either required no tests for admission, or with freshmen with mean combined verbal and math SAT's or ACT equivalent scores of less than 900. Each successive selectivity group included freshmen with scores of 100 points more than the lowest group. The top group of most selective schools enrolled freshmen with combined mean SAT's over 1200.

The most selective schools had national reputations and enrolled more than 50 per cent of all freshmen from out-of-state. Another set of schools which enrolled at least 25 per cent of out-of-state freshmen were called regional schools. Other schools were either classified as state-wide schools, on the condition that they provided dormitory space to at least 25 per cent of the undergraduates, or commuter institutions if less dorm space was available.

On the basis of information provided by the College Entrance Examination Board, students in each type of school were cross classified by ability. Another classification of students by ability by tuition level paid was also prepared. Special pains were taken to estimate the proportion of out-of-state students who pay higher tuition in public institutions. Recent trends (1970 to 1973) in enrollments were used to allocate the total enrollment in 1985 by type of school.

With too much space and too few students, it would only be

natural for keen competition to develop among colleges. Private schools could be expected to be under increasing pressures to set tuitions in a way to attract students from each other, and public institutions very well might intensify their efforts to draw students away from the private sector.

Our analysis of costs in higher education throws a good deal of cold water on these eventualities. For example, private schools do not have the ability to engage in price competition successfully. The marginal costs of instruction, we have determined, are 20 to 40 per cent higher than the average tuition charged by the public schools. Furthermore, selective competition, or discrimination, is extremely difficult in the private sector, since no college is ever sure of the number or type of students likely to accept its offers of scholarships. In other words, most private schools can neither afford to target selected rebates to students, nor would they know how to do it.

An exception to this finding are the national private schools with the highest reputations. They are in a position to stem reductions in their enrollments, and could possibly even grow during a period of overall declining enrollment. The number of applicants to these schools far exceeds the number admitted, and a large proportion of those who are admitted do matriculate in the fall. Hence, it is quite possible for these schools to step up their recruitment and attract high aptitude

students from other schools. This is labelled the elitist strategy in Table A. Alternatively, these schools might adopt an income maximization strategy and lower their admission requirements slightly and admit additional students who are able to pay their high tuition.

The effect of both these strategies upon other selective private schools is to reduce their enrollment quite drastically. Especially if the more likely income maximization strategy is adopted, some 40 per cent of the students would be drawn from the better private regional schools. In the face of this competition, it is likely that regional schools losing the students would be forced to lower their entrance requirements in order to recruit additional students with the wherewithall to pay their fees. Most of these students will come from schools with less prestige within the private sector. Incremental changes in enrollments for two levels of enrollment changes by national schools, and the effect of concurrent efforts of national schools and selective regional schools to increase their share of market is shown in Table A. While income maximization strategies of national schools are likely to impact solely the private sector, it is possible for regional schools, some of which have lower tuition, to draw some students away from the public sector.

By contrast, it is conceivable that public schools can attract students away from private institutions either by cutting their tuition

TABLE A

EFFECT OF EXPANSION OF SELECTIVE SCHOOLS
ON OTHER INSTITUTIONS, 1985

(thousands of FTE students)

	National	Private Selective Regional	Other Private	Public
Elitist	+31	- 3	- 4	-24
Income Maximization	+31	-12	-19	-
Elitist	+61	- 5	- 8	-48
Income Maximization	+61	-24	-37	-
Elitist	+31	+22	- 9	-44
Income Maximization	+31	+22	-35	-18
Elitist	+61	+22	-13	-70
Income Maximization	+61	+22	-58	-25

Source: Special Tabulations, HEGIS Surveys V and VIII (1970, 1973).

fees drastically, as was done in Wisconsin, or by waiving or eliminating out-of-state tuition charges. If presidents of state institutions can persuade state legislators to fund the post-secondary sector generously, it is quite possible that public schools will maintain past levels of enrollment and impact enrollments in the private sector quite drastically.

If the more selective public schools continue to grow at the same rate they did between 1970 and 1973, and if other public schools take steps to stabilize their enrollments at the 1973 levels, it is possible that by 1985 enrollments in the private sector would be reduced by one-half. In all probability, the elite national schools would be least affected by this move, as would the private commuter schools, which have a monopoly in their immediate market. Such developments are not likely in the short run, but they do imply a 78 per cent decline in enrollment in private institutions which are either regional or state. (See Table B.)

A much more likely development is the freezing or lowering of out-of-state tuitions by public schools. This policy would affect most drastically regional schools which enroll large numbers of students who cross state lines. While the total number of students likely to be diverted is not very high, we believe that public school policies to lower out-of-state tuition could cause enrollment in these schools to decline by some 20 per cent from the projected figures. (Table B)

There is no body of theory which is useful in forecasting

TABLE B

IMPACT OF PUBLIC SECTOR EXPANSION STRATEGIES, 1985

I

Public Growth to Prevent Enrollment Declines

Public Desired	4,580
Public Projected	4,056
Difference = Impact on Private Sector	524
Private Projected	1,092
Impact as Per Cent of Projected	48
Private After Impact	568
Projected National Schools	174
Projected Commuter Schools	243
State and Regional After Impact	151
Impact as Per Cent of Projected	72

II

Impact of Abolition of Out-of-State Tuition

Private Enrollment After Abolition of Out-of-State Tuition	983
Private Enrollment Projected	1,092
Difference = Impact on Private Schools	-109
Per Cent of Projected Private Enrollment	-10.0
Impact on Private Regional Schools	-103
Per Cent of Projected Private Regional Enrollment	-20.0
Impact on Private State Schools	-6
Per Cent of Projected Private State School Enrollment	-3.8

Source: Special Tabulations, HEGIS Survey, and text.

how students will react to changes in tuition levels, or even to different admission policies of post-secondary institutions. The models of student behavior which have been developed thus far to simulate the response of students to changes in cost or admission policies are still primitive, and their authors warn that they should not be used to make policy. An examination of the parameters of the models suggests that the demand for post-secondary education is particularly inelastic among gifted freshmen, and not too elastic for all freshmen. These models imply that reductions in tuition are not likely to solve most schools' financial problems. The schools may well be left with less money rather than more after the effects of even selective price cuts have been dissipated throughout the system.

In all probability, private school administrators will continue for the next ten years to adhere to the policies of the last decade. The very best private schools will have little trouble filling their freshman classes, although they will probably open their doors wider to the less-gifted children of affluent parents. The weaker, second tier schools will have a harder time. Under the pressure of competition from the public sector as early as in the five years ending in 1970, these schools had already reduced their entrance requirements, doubling the proportion of students in their freshman class who had SAT verbal scores of less than 500. Schools that were even less selective simply

could not compete, and lost enrollment.

We contend that private colleges and universities will have no choice but to lower admission requirements to attract students who can afford to pay the high tuition fees they charge. Those with better reputations will draw students away from the colleges that are less highly regarded. These lesser private schools (except those catering to commuters, which presumably have the monopoly of location) will lose a considerable portion of their enrollment and may be forced to close their doors.

The size of the private sector depends upon policies in the public sector. If public schools intensify their recruitment, reduce tuition fees or use their political muscle to reduce or eliminate the special state tuition programs that encourage enrollment in private schools, it is possible that only a handful of private prestige schools and a number of small private commuter colleges will continue to operate by the end of the millennium.

We do not believe that this drastic change will actually take place. College administrators are notoriously poor competitors, and they have very little information about effective ways of attracting students. Between 1970 and 1973, a period during which many private and public institutions lost students, there were few signs of price competition. Instead, some schools encouraged more alumni to recruit for

them, some hired professional student-hunters, and others advertised in youth-oriented publications. Others changed their curriculum to become more attractive. Few, if any, tried to steal students from one another by selective price-cutting.

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INTRODUCTION

The current uncertainty about future levels of post-secondary enrollments is causing the administrators of colleges and universities a great deal of worry. The level of enrollment in higher education has lagged behind the forecasts made only a few years ago, especially for degree-credit undergraduates, and it is quite probable that between 1975 and 1985 the total number of undergraduate students enrolled will actually decline.

While only a few years ago, students were competing for a limited number of spaces in post-secondary institutions, for the first time in two decades the increasing capacity of these institutions has not only caught up with the number of students likely to seek places, but exceeded it. Thus, a fairly well qualified student can today opt for any number of institutions and have a good chance to be accepted. The control over the level of enrollments has shifted from the hands of administrators to those of the students themselves.

The prospect of operating institutions of higher education in a no-growth environment is quite disturbing to most college administrators. Facilities and faculties had been planned on the assumption that enrollments would continue to rise, and now administrators are disappointed and worried. According to the estimates we present below, by 1985 facilities in the public sector alone should be sufficient to enroll

all post-secondary students, and those in the private sector could accommodate at least three times the likely enrollment.

This study discusses the possible effects that the surplus of space could have upon the admission and pricing policies of institutions. If competition for students develops between institutions, what form will it take, and who is likely to be hurt or helped?

RECENT DEVELOPMENTS IN UNDERGRADUATE ENROLLMENTS

Despite the fact that total undergraduate enrollments[1] increased by some six per cent between 1970 and 1973, the last few years were trying ones for college administrators. Most of the growth in enrollments took place in non-degree credit enrollments, accounted by mostly vocational students. Combined public and private undergraduate degree-credit enrollment increased by less than three per cent. Since non-degree students generally attend public community colleges or low selectivity institutions, the vast majority of schools, which catered to degree-credit students only, either did not grow very rapidly, or lost enrollment. In actual fact, absolute levels of degree-credit undergraduate enrollments declined by some four per cent in the private sector.

Among degree-credit undergraduates, an increasing proportion opted for instruction in the public sector; the share of degree-credit undergraduate enrollment in private schools declined from 27 to 25 per cent during these three years. A large number of institutions in the

private sector experienced reduced enrollments, and some stopped rationing places as severely as they had hitherto. The lessening of academic requirements for admission was not sufficient to overcome the effects of higher tuitions in the private sector, which continued losing share of market.

The slow growth in the enrollment of degree-credit students even resulted in absolute declines in the number of this type of undergraduate in two states and the District of Columbia. Enrollments in public institutions declined in 20 states, and the number of degree-credit students enrolled in private schools was lower in 1973 than in 1970 in 33 states and the District of Columbia. (See Table 1.)

Classification adopted by this study. We believe that the most viable way of defining "markets" for undergraduate students is to cross-classify schools both by selectivity and category. In this way, undergraduate students' choices are differentiated both by their ability and geographic mobility.

In the discussion below schools are classified by (a) selectivity, (b) their recruitment area, and (c) level of tuition charged. This classification is better suited to the analysis of policies by institutions than the crude classification of schools by type (universities, other four-year colleges, and two-year colleges) and even to the more sophisticated Carnegie classification, which emphasizes graduate facilities. The Carnegie classification is probably more appropriate when both undergraduate and graduate enrollments are considered,

since a number of Carnegie types, e.g., "research universities" and "selective liberal arts colleges," compete for the same type of undergraduate students.

Enrollments by level of selectivity. The proportion of students in public schools increased in all types of schools, except for the most selective. Only schools which catered to the most able students in the private sector were able to increase their enrollments in absolute numbers.

If the private and public sectors are combined, two types of schools increased enrollment: those catering to the most gifted students, and those that were least selective.

This study stratified schools by five levels of selectivity on the basis of combined SAT, or equivalent ACT scores as follows:

Selectivity level 1: SAT scores of 1,200 or over
Selectivity level 2: SAT scores of 1,100 - 1,199
Selectivity level 3: SAT scores of 1,000 - 1,099
Selectivity level 4: SAT scores of 900 - 999
Selectivity level 5: SAT scores below 900 or no tests required.

Schools in the HEGIS universe were merged with an ACE tape, and the results carefully edited.[2]

Most discussions of trends in enrollments place great emphasis upon the behavior of selective schools. In fact, less than five per cent of the degree-credit enrollment is in the most selective schools, and another 10 per cent in schools where the combined freshmen SAT scores are between 1,100 - 1,199. By contrast, 30 per cent of all degree-

credit students in 1973 attended schools which either required no previous ability testing or in which scores were below 900.

Enrollments for 1970 and 1973 by level of selectivity of schools are shown in Table 2. This table could also be used to illustrate the fact that the proportion of students attending private schools is highest in selective schools, and declines as the selectivity of schools declines. It is also interesting to note that enrollments in the private sector declined most noticeably among the middle selectivity private schools.

Enrollments by category of school.[3] Another way of analyzing the changes in enrollments is to classify schools according to the scope of their recruitment. A small number of schools attract students from all over the United States. These schools are generally very selective, their freshmen have mean combined SAT scores of 1,200 or more, and they recruit less than half of their new students from in-state. For purposes of this study, they have been called national schools. Besides Ivy-League institutions, these include prestige liberal arts colleges and leading engineering schools.

Other schools with somewhat lesser reputations, with lower SAT scores, and with at least one quarter of their freshmen recruited from out-of-state, were classified as regional schools. Examples of regional schools in the private sector are Syracuse University or Goucher College, southern schools such as Tulane or the University of Miami.

State schools which allow high levels of out-of-state enrollment and possess substantial pulling power because of academic, geographic, or other attractions, such as the University of New Hampshire or Arizona State University, were also classified as regional schools.

The remaining institutions were classified into two categories: schools which recruited state-wide, and predominantly commuter schools. It was inferred that a school recruited its students outside its immediate area when it provided dormitory space for more than 25 per cent of its undergraduates, which put it in the category of a state school. If it did not, it was classified as a commuter school.

Enrollments of undergraduates in 1970 and 1973, classified by category of school, are shown in Table 3. Once again, national schools catering to the elite had a high rate of growth, exceeded only by that of commuter schools. In the public sector, regional schools gained ground relative to state schools, reflecting the shift to better-known schools.

The enrollments by category within selectivity classes appear in Table 4. The schools in the public sector which gained the most students between 1970 and 1973 were usually concentrated at the two sides of the ability spectrum. Thus, both public regional and state schools catering to the brighter students gained a share of the market, and

non-selective state and commuter schools increased their population most rapidly. In the private sector, the most selective schools, which recruited nationally, did not lose enrollment at all, and the commuter schools catering to the lowest ability grouping actually gained some. Among regional schools, those catering to the most able students lost the least enrollment of all schools showing an enrollment loss.

Non-degree enrollments. Enrollments of non-degree credit students are increasing faster than other degree-credit undergraduate enrollments. They grew 63 per cent between 1970 and 1973, and by this later date accounted for some 11 per cent of the total undergraduate enrollments. As can be seen from Table 5, some 94 per cent of these enrollments were in the public sector in 1973 and, again, the lion's share of the enrollments are in low selectivity, commuter schools.

ESTIMATES OF ENROLLMENTS TO 1985

Very few series project enrollments to 1985. The Census projections of enrollments are relatively old, and are based on the experience of the late 1960's. The National Center for Educational Statistics has projected enrollments only through 1982, and its methodology is affected by the zigs and zags of enrollments in the last year. The Carnegie Commission on Higher Education's projections of enrollments are being revised by the successor research organization, which would not make its preliminary results available to this study.[4]

Recently, we prepared a set of projections of enrollments which, on the whole, seemed to be in fair accord with the latest thinking of the Carnegie research group.[5] The degree and non-degree credit enrollments, according to this projection, were to reach a peak sometime in the mid-1970's, decline imperceptibly through 1980, and go down another three per cent by 1985. By contrast, these projections indicated that degree-credit enrollments would peak by the mid-1970's and decline by some three per cent for each of the next five-year periods. The proportion of degree-credit undergraduates in the private sector is estimated to decline by another 5.6 per cent between 1970 and 1985, in line with past trends.

Enrollments by selectivity of schools and category were projected for the 15-year period, using trends derived from recent experience, i.e. the slow-growth period 1970-73. They appear in Table 6. The bottom of Table 6 includes an addendum which also shows total degree and non-degree credit enrollments in low selectivity schools.

Our projections imply that, in the aggregate, degree-credit enrollment in public schools will decline by some six per cent between 1975 and 1985. Very selective schools, in the top two SAT selectivity levels, will maintain 1975 enrollment levels, and the least selective schools are likely to continue growing. Middle-selectivity schools in the public sector will feel the brunt of decreasing enrollments.

The decrease in degree-credit enrollment in the private sector, projected to be some 20 per cent between 1975 and 1985, will, for the most part, affect regional schools which are not very selective, those in selectivity levels 3 and 4. Schools recruiting within a given state will also be affected, especially those which are not selective. Commuter schools which cater to the lowest selectivity students will go counter to the trend and grow.

Distribution of students by selectivity of school and tuition level, 1985. Schools at each level of selectivity enroll varying proportions of students in specific ability groupings. In 1970/71, schools with freshmen whose average SAT score exceeded 1,200 enrolled 60 per cent of the freshmen with verbal scores over 600, some 30 per cent of freshmen with scores of 500 - 599, and ten per cent with scores lower than 500. Schools in the second selectivity category, whose freshmen have average combined scores of 1,100 - 1,199, had freshman classes with 29 per cent of their students with scores over 600, some 40 per cent with scores between 500 and 599, and 30 per cent with even lower scores. In the next two selectivity groups, the percentage of freshmen with scores over 600 declines to 14 and 9 per cent, while that of freshmen with scores under 500 increases to 49 and 61 per cent. The least selective schools had fewer than five per cent of their students with verbal SAT scores over 600, and over 80 per cent with similar SAT's under 500. (See Table 7.)

The proportion of enrolled students by these three ability groupings for public and private schools is shown in Table 8. Two sets of figures are presented, one for 1970, the other for 1985. For both years, the distribution of student ability in schools of each level of selectivity was assumed to remain constant. The 1985 estimates of ability distribution, which were made entirely by projecting past trends of enrollments without regard to the ability distribution of students, produce an intuitively reasonable mix of ability levels for post-secondary institutions.

Enrollments of students by ability level are also disaggregated by level of tuition, among high and low tuition schools in the private sector, and in the public sector by levels of in-state and out-of-state tuition. This last disaggregation was performed in order to pinpoint the proportion of students in the public sector who pay tuition fees roughly equal to those charged by the cheaper private schools, because they attend schools in states other than those in which they reside. (Table 8)

The distribution of students by selectivity of schools, shown in the above table, indicates that roughly seven per cent out of 12.8 per cent of freshmen with verbal SAT's over 600 currently attend schools which are relatively unselective. Although the proportion of gifted freshmen in these schools is low, the aggregate number is quite high. Similarly, about half of the freshmen in the mid-ability grouping attend non-

selective schools. This bodes well for the schools with higher selectivity. As students continue to upgrade their choice of school as selectivity barriers are lowered, better schools are likely to keep up their student rolls, even if total enrollments decline.

AVAILABLE SPACE TO 1985

In a study completed in 1974, we estimated that 8.5 available square feet of classroom space was considered sufficient per full-time equivalent student. If more stringent, California-mandated standards were to be used to determine the capacity of schools, a still lower figure of 6.5 square feet could be used.[6]

Even with the more generous requirements, in 1970 the public sector could accommodate 1.6 times the number of students enrolled in it. The private sector could have enrolled 2.5 times the number of students enrolled in 1970. If the more modest space standards were used to calculate the capacity of the public and private sectors, twice as many students could have gone to public schools, and 3.3 times as many students as were enrolled could have been accommodated in the private sector. (See Table 9.)

Since that time, construction has been continuing, although at a reduced rate.[7] We have estimated that in the course of the past three years, the additions to classroom space in the public sector have

been made at half the rate of the 1968-1970 period. Construction has slowed down even more in the private sector. Our rough estimates place the classroom space in the public sector at some 90 million net available square feet by 1985, up by 50 per cent from the levels of 1970, and 26 million net available square feet in the private sector, an increase of roughly a third. We thus estimate that the average classroom space available per student in the public sector will increase from 13 to 15 square feet per full-time equivalent student, and in the private sector from 21 to 26 square feet. The space capacity of the public sector is projected to be some 60 per cent higher than will be required by the level of enrollments, and that of the private sector some 230 per cent more.

It is thus unlikely that space will play a role in limiting the level of enrollment for most schools. By 1970, with the possible exception of some southern schools and a few urban community colleges, it had already ceased to do so.

THE FUTURE OF COSTS OF INSTRUCTION

The discussion of costs of instruction in the post-secondary sector is very complicated because (1) costs vary a great deal between schools, and (2) there is no consensus on how costs vary, either over time or as a function of the growth rates of a school.[8] The prognosis of costs of schools for the period 1975-1985 is further complicated by

the projected declines in enrollments, an unprecedented state of events in the post-secondary sector.

During a period of declining enrollments, a school is saddled with certain fixed costs, such as the operation of plant and minor maintenance. It is not at all clear to what extent other costs, such as administration, instruction, and library outlays, are fixed costs or vary with enrollment. When enrollments are increasing, these outlays may grow in proportion to the higher student load. When enrollments are declining, cutbacks in outlays for faculty to preserve the traditional pupil/teacher ratio may result in lower aggregate expenses. Schools may also tighten their administrative and other budgets.

Projections of future levels of costs are difficult because (1) a decrease of staff proportional to the decline in enrollments does not necessarily result in an equivalent percentage decline in costs. Post-secondary institutions have little leeway in firing tenured faculty, so the reductions in staff affect the cheaper, non-tenured faculty; and (2) dis-economies of scale begin to manifest themselves as enrollments decline. For instance, all colleges and universities have a president, and it is difficult to cut his salary if enrollments decline. Nor is it possible to call in a bulldozer to raze existing buildings.

The probable faculty mix by selectivity and category of

school is very difficult to forecast. In the past few years, as growth rates of enrollments declined, schools began both to ration tenured positions and slow down the promotions of tenured staff. Nevertheless, the proportion of tenured staff to total staff did increase by a few percentage points in the past few years.[9]

Present trends indicate that in the next ten years, schools will have to continue arbitrarily limiting the proportion of staff which will be tenured. If ordinary promotion patterns are followed, more than three-quarters of the staff will be tenured by 1985.[10] It is quite likely that the tenured faculty will be restricted to no more than 60 per cent of the total. Some schools, especially those in the private sector, may find themselves with even higher proportions of tenured faculty. A private school with 50 per cent tenured faculty today might well lose some 10 per cent of its tenured staff in the course of the next 10 years. Were its enrollments to decline by 30 per cent, and the non-tenured faculty reduced to keep current student/teacher ratios, the proportion of staff with tenure could increase to 65 per cent.

The increase in the proportion of senior staff will cause increases in relative costs of instruction. To remain competitive without raising tuitions unreasonably, schools may both increase the ratio of students to faculty, and try to compete for students.

Limits to faculty cuts. Unless all schools cut their faculty

at the same rate, there are limits to how much a school can cut its faculty and remain attractive. As Table 10 shows, the more selective schools, which continue to attract the best students, have more faculty per student compared to the schools with fewer able students and less prestige. The private sector can also boast of a lower student/faculty ratio than the public sector. The only exceptions to this rule are the least selective schools, which are generally small. The average enrollments per school in the public sector in this selectivity group are 1,396, and in the private sector 311, less than half the average size of schools.

How much could schools decrease faculty ratios and still remain competitive for the type of students they want to attract? A reasonable way of estimating the maximum possible enrollment increases in each sector is to assume that schools with the highest proportion of faculty will expand enrollments to the level where their student-faculty ratio is equal to the one observed in the next lower quintile. Schools in each selectivity category were ranked by ascending student-faculty ratio, and the above calculation carried out with the limitation that the student-faculty ratio in no quintile of private schools would exceed the average student-faculty ratio of the public sector in the same selectivity class. The result of this exercise was that most selectivity categories could expect to increase their enrollments by 20 per cent, give or take a few percentage points. (See Table 10.) This strategy would be viable only if public schools followed it as well.

Marginal costs and faculty costs and ratios. The significance of the above exercise is that private schools could probably control the increase in their relative costs by reducing their student/faculty ratio to offset the cost increases resulting from the higher proportion of senior faculty. This is the only viable strategy for the private sector in the aggregate. Some private schools could hope to attract more students (from other private schools) by keeping tuition rates low or by stepping up their scholarship offers. We shall discuss the potential of this strategy below. Here we shall note, in passing, that losses in vitality and quality of instruction may be quite serious in a school staffed only with older professors.

Cutting down on the faculty affects only a fraction of the full cost of instruction in most schools. In public institutions, faculty salaries were estimated to amount to some 43 per cent of instructional and related costs; in private schools, because of the larger costs of administration, these costs amount to 36 per cent.[11] We have further estimated that support costs, directly related to enrollment, amount to some 50 per cent of the direct instructional costs. Unfortunately, when faculty is cut, it is junior faculty which is either not hired or fired, so that the average cost of the faculty member who is sacrificed is only 70 per cent of the average salary paid to the faculty. (See Table 9.)

The marginal cost of instruction, it is argued here, is the

cost of teaching students by using junior faculty. The calculations to derive these marginal costs were made as follows: (1) instructional costs per undergraduate student were calculated, (2) faculty outlays were set at 43 per cent of instructional costs in public institutions and 36 per cent of costs in private institutions, (3) junior faculty was found to be 70 per cent as expensive as average faculty, (4) a 50 per cent overhead rate for support was added to these costs, and (5) marginal costs were thus calculated to equal .45 and .38 of average instructional costs. The estimates of marginal costs and the figures used to derive them appear in Table 11.

These estimates are based upon data for 1970. If anything, the competitive position of private schools has since deteriorated. We estimate that their marginal costs had increased about 15 per cent by 1973-74, owing to increases in assistant professor and instructor wages. Concurrently, tuition in the private sector increased by 12 per cent in the national schools, which are making up this lag by drastic raises in tuition for the 1975-76 academic year. By contrast, there has been an increase of some 18 per cent of tuition in regional schools where freshmen SAT scores ranged between 1,100 - 1,199. The tuition increased only about eight per cent for the less selective schools, which must have cut their staffs some to live with less revenue in real dollars. NCES estimated that private tuition increased 24 per cent in this period,

roughly equivalent to increases in average cost. We do not trust these estimates.

In the public sector, the more selective schools raised their tuition by only eight per cent according to our estimates. Overall, according to NCES, public schools raised tuition and fees by some 28 per cent.

This analysis leads to the following conclusions: (1) the competitive condition of the selective private schools deteriorated somewhat, and (2) that of the less selective private schools could not have improved much despite increases in tuition of "cheap" public schools. Although the ratio of private marginal costs to public tuition might be lower today, the dollar gap must have increased.

Possible competitive position of private schools. On the face of it, the private schools are poorly equipped to compete with public schools. Within most selectivity category groups, the ratio of private marginal costs to state tuition is above 1.3. Marginal costs and state tuition come close to being equal only in the case of high selectivity state and commuter schools, and possibly low selectivity regional schools. These schools account for only seven per cent of the private, and less than two per cent of the total degree-credit enrollment. The private sector is forced to charge between $250 and $500 more than the public sector just to cover variable costs of teaching students with junior faculty.

This limits the private schools' chances of diverting students from public schools.

CHOICES BY STUDENTS

Attempts were made to determine how variations in institutional charges (e.g. tuition) affect student selection of educational alternatives. These included (1) examining models of student choice, and (2) attempting to explain changes in enrollment 1970 to 1973 through regression of resources, tuition, SAT scores, etc.

Models of demand for higher education. A variety of approaches were reviewed to find a model suitable for evaluating the effects of changes in tuition and fees, and selectivity upon student enrollment patterns. We concluded that current efforts to model student behavior were primitive and could only be used for illustrative purposes. Existing data bases are not suitable for the building of realistic models of student behavior, and simulations of student choices suffer as a consequence.

For instance, an early model of student demand for higher education was developed by Miller and Radner.[12] This model, used by the National Commission on the Financing of Postsecondary Education,[13] dates from 1969. It is of the "conditional logit" type[14] because it assumes the Weibull distribution for a joint probability function--a choice dictated by mathematical tractability of the likelihood function and the resulting equations. This type of model incorporates a feature known as "independence of irrelevant alternatives"--the ratio of the probabilities

of choosing any two options is independent of all other options. Suppose, for example, one type of school raises its tuition, thereby lowering its demand. The model dictates that the number of students who fail to choose the school which raised its price be added to all other options (other types of schools and the no-school option), and prorated in proportion to their original popularity. The credibility of postulated responses is subject to some question, especially in the case of extreme changes.

The Miller-Radner model uses selectivity (average SAT score) and cost (tuition, fees, and room and board where applicable) as the institutional variables. Student variables are individual ability (average SAT score) and family income. Conditional probabilities of choice are computed for twelve student categories (four ability levels and three income levels) and nine types of schools, varying by selectivity and cost, and a "no-school" option. The model can be easily adapted for alternative arrays of educational opportunities since one need only specify other cost levels and selectivity for each option. By using the numbers of potential students in each income, ability class and applying the M-R probabilities, the total demand (as well as details by income, ability) may be easily computed for each option.

Another model, displaying considerable imagination has been developed by Kohn, Manski and Mundel[15] (referred to as K-M-M below). They used the 1966 SCOPE data as well as other sources to calibrate a

two stage model of college going behavior. Their model, developed after the Miller-Radner model and intended to overcome some of its weaknesses, shares some of its features. The K-M-M model incorporates a sub-model of college choice (also of the "conditional logit" type) which gives the conditional probability of choosing a particular college from a set of college options, depending on the individual student characteristics. The other sub-model gives the probability of attending college rather than other alternatives (going to work, joining the armed services, not working, etc.). The K-M-M model includes (1) institutional variables--tuition, room and board charges, average student ability, field breadth, per student revenues, dormitory capacity, and (2) student variables--family income, ability (SAT scores and class rank), home-to-college distance, parental education, sex and residency preference.

K-M-M present two calibrations of their model, using the Illinois SCOPE data and the North Carolina SCOPE data separately. Conceivably, several different calibrations would be needed to adequately represent all the states. The authors' own evaluation of the present form of the model is: "In their current state, the usefulness of our models of college choice and college going in the policy-making process is somewhat restricted." Its current use is probably limited to single states and institutions.

Most[16] of the remaining papers which we reviewed offer

varying mixtures of ideas, advice and criticism of models of this type, but presently nothing concrete or comprehensive. The state of the art was summarized by Dresch[17] in his review of student choice models:

> Most briefly stated, an adequate model of the postsecondary education system must incorporate the significant determinants of a) student behavior and b) institutional behavior. This most serious weakness of previous research is its very partial approach to student behavior and its almost complete ignorance of institutional behavior...
>
> With reference to student behavior, the most serious inadequacy of previous studies is that they have attempted to explicate the process of educational decision making entirely in terms of the characteristics (socioeconomic and academic) of the student himself, with virtually complete disregard for the environment within which his decisions are made, e.g. the range of educational options available, the state of the labor market for persons with different types of skills and education. In effect, this environment is assumed to be constant and unchanging.
>
> This failure derives in large measure from the unavailability of appropriate data for analysis of 'environmental impacts'...
>
> The paucity of knowledge of institutional behavior is reflected in an additional limitation of existing demand studies, their failure to consider the feedback from institutional practices to student decisions...

Dresch continues, specifically referring to the K-M-M work as an improvement over previous models:

> (K-M-M is). . . an attempt to improve upon these studies. As such it is unexceptionable. At this stage the model is self-evidently a comparative static demand model, and operationally its designers have not attempted, in this dimension, to press it beyond its capabilities; by the same token, they should not attempt to peddle estimates of, e.g.,

the enrollment impact or budgetary cost of a particular federal student aid program as a quantitative prediction of an actual outcome.

judging from the comments of Dresch and our review of the available literature, it will be some time before the state-of-the-art of student demand modeling will be sufficiently far advanced and based on adequate data to provide reliable answers to the basic questions posed above.

Implications of the Miller-Radner model. In spite of the difficulties and limitations of the current student demand models, it was decided to see what could be gained by attempting to adapt a model to the requirements of this study. The only model which could be easily used is the Miller-Radner model (abbreviated as M-R below). The twelve student groups of M-R were taken to represent the population of potential students. Each group represents one of the possible combinations of family income ($6,000, $12,000, and $18,000) and student ability (SAT scores of 375, 475, 575 and 650). The ten institutional options (represented by cost, selectivity pairs in the M-R model) were as follows:

1. No-school (cost = $0, selectivity = 374).
2. Low Cost, Low Selectivity--typically commuting to a public community college (cost = $290, selectivity = 430).
3. Low Cost, Medium Selectivity--typically commuting to a public state college (cost = $400, selectivity = 519).

4. Low Cost, High Selectivity--typically commuting to a public university (cost = $540, selectivity = 564).

5. Medium Cost, Low Selectivity--typically trade schools and private junior colleges (cost = $2,200, selectivity = 430).

6. Medium Cost, Medium Selectivity--typically public state colleges not within commuting distance of the students' high school, and lower tuition private colleges, primarily within commuting distance (cost = $1,300, selectivity = 519).

7. Medium Cost, High Selectivity--typically state universities away from home (cost = $1,440, selectivity = 564).

8. High Cost, Low Selectivity--private colleges and universities (cost = $3,200, selectivity = 500).

9. High Cost, Medium Selectivity--private colleges and universities (cost = $3,200, selectivity = 540).

10. High Cost, High Selectivity--private colleges and universities (cost = $3,200, selectivity = 625).

These are the postsecondary options as presented by M-R in an illustrative example of the use of their model. They differ somewhat in detail from the group means for the institutions actually used in its calibration. Potential students of the lowest ability (SAT = 375) were constrained to select options 1 (no school), 2 or 5 only. Those with SAT = 475 were excluded from options 4, 7 and 10. Option 10 was not available for those with SAT = 575. The highest ability class was unrestricted in their choice of options.

Using these options and representative student classes along

with the parameters estimated by M-R from the California SCOPE data, the probability that a potential student from a given class chooses a specified option was computed using the M-R model. In order to translate these probabilities into overall probabilities of choice for the various options, we weighted each one by the number of potential students in the appropriate class and aggregate across classes. In order to do this, weights were developed from the numbers of students in the SCOPE sample presented by M-R. Students whose family income was reported to be less than $7,500 were aggregated by ability group to produce weights for the $6,000 family income classes. Those between $7,500 and $15,000 were grouped to obtain weights for the $12,000 classes. Weights for the $18,000 classes were based on those in the sample reporting family incomes greater than $15,000. The (normalized) weights are given in Table 12.

The weighted probabilities represent the relative popularities of the various options. (See Table 13.) For example, given 1,000 high school seniors, 189 could be expected to choose option 1 (no-school), 121 would choose option 2 (low cost, low selectivity), etc.

In order to translate these probabilities to total enrollments, some detailed knowledge of retention rates would be required. However, a comparison may be made between the expected number of high school seniors choosing some form of postsecondary education and the first-year

college students enrolled in the fall of 1970. There were 2.84 million high school seniors (grade 12) in the United States in 1969-70.[18] The model predicts that 81.1 per cent or 2.30 million of them would have chosen one of the options 2 through 10 (all except no-school). On the other hand, the Bureau of the Census[19] estimates the number of 18-year old first-year college students to be 1.15 million for the United States in the fall of 1970. If 17 and 19-year olds are added, the total is somewhat less than 1.65 million. This figure probably overestimates the number of high school seniors (1969-70) going directly to postsecondary institutions upon graduation. Young[20] gives the proportion of 1970 high school graduates enrolled in college in October of that same year as 52 per cent. Thus, the correct figure for 1970, based upon high school seniors, is probably somewhat less than 1.48 million. The implication is that the M-R model substantially overestimates the popularity of choosing postsecondary education in 1970. One could not expect that its predictive capability for any individual option would be any better.

Despite its shortcomings, the M-R model could be used to infer the effects of some changes in policy. The weighted probability (or market share) of a given sub-set of schools may be thought of as a function of cost and selectivity. One may then examine the parametric curves, at constant selectivity, of demand vs. cost. After scaling the probabilities so that those for options 2 through 10 add to 1.0, these

parametric curves are shown in Figure 1. The slope of each curve represents the change (decrease) in market share to be expected from an increase in cost (provided the change is small). As might be expected, the effect is most noticeable in the case of the less selective schools (SAT average = 430), and the effect decreases with increasing cost. The more selective schools are less influenced by a cost increase, although at higher costs, there is little difference in the effects for selectivities of SAT 519 and SAT 564.

The Miller-Radner model was applied directly to evaluate changes in the parameters (cost, selectivity) of individual options. For example, the effects of decreasing the cost of option 8 from $3,200 to $2,700 (by decreasing tuition or other costs) are shown in Table 14. Here the probabilities have been normalized so that the sum for options 2 through 10 is 1.0--these are given in the columns labelled "Share." By decreasing the cost of option 8 (the less selective private colleges and universities) by about 15 per cent, the predicted gain in the share of option 8 increases about 8.5 per cent (from 6.6 per cent to 7.1 per cent). Thus, the demand for option 8 is inelastic--the gain in demand is not large enough to offset the decrease in cost. (In fact, it can be shown that the demand for each of the options 2 through 10 is inelastic with respect to its own cost.) The shares for all other options are decreased slightly by this change. Similar reductions (15 per cent) in all private

colleges and universities (the three higher cost options 8, 9 and 10) simultaneously produce gains of about 7 per cent, 6 per cent and 3 per cent, respectively. Thus, the 8.5 per cent gain that option 8 had established above is reduced [illegible] per cent by reducing the costs of options 9 and 10.

The effects of a decrease in selectivity are not so straightforward, since response varies with student group. The model implies that lower ability students are attracted to a school which reduces its selectivity, while students with greater ability are discouraged from choosing that same school. For instance, using the original array of options of the M-R model, the selectivity of option 8 (private colleges and universities) was reduced from an average SAT score of 500 to an average SAT score of 430. The results of this change in selectivity are shown in Table 15. The net effect for option 8 is a loss of about 14 per cent of its original "market share." The gains in demand among the students of low ability are more than offset by decreases among high ability students. The options with higher selectivity (3, 4, 6, 7, 9, 10) experience gains in demand from one to three per cent each from the higher ability students. The low selectivity options, 2 and 5 (public community colleges, trade schools and private junior colleges), show decreases of 3.2 and 2.4 per cent, respectively, due to the added competition from option 8 for low to medium ability students.

It is important to note the sensitivity of the M-R model to the description of the options available to high school seniors. The options we have used above were presented by M-R in an illustrative example of the use of the model. In addition to this, M-R presented a somewhat different array of options, representing the group means for the institutions used in their calibration. The sensitivity of the model to these different assumptions is shown in Table 16 where demand estimates derived by using group means are contrasted to the other set of options. Options 1, 4 and 7 (no-school, commuting to public university, and resident at state university, respectively) have about the same cost and selectivity in each array of options. However, the differences in weighted probabilities for these options are as high as 12 per cent. Options 2, 3 and 6 have similar selectivities in each sample, but have increased costs in the calibration sample with attendant decreases in weighted probability. For the remaining options, the changes are mixed and the results are not easily interpreted. Overall, either 81.1 per cent or 82.3 per cent of potential students choose some form of school (rather than no school), depending on which array of options one uses. Other arrays of options, defined in terms of cost, selectivity pairs could be expected to produce still different results.

Our application of the Miller-Radner model should serve to demonstrate that it leads to plausible results, especially in terms of

the direction of the responses to changes. For instance, for schools of similar selectivity, student demand decreases as cost increases. This effect is strongest for the low selectivity schools. For the array of post-secondary options evaluated in this exercise, the demand is inelastic with respect to cost. A decrease in selectivity for a given option tends to increase the demand by low ability students while decreasing the demand for that option by higher ability students. The model is sensitive to changes in the description of available options in terms of cost and selectivity.

A number of questions must be resolved before results can be used to influence governmental policies. Some of the more important questions are:

1) Are the weights which we derived from the SCOPE sample (numbers of potential students by ability and income) adequate, or should others, more representative of the national population of high school seniors, be developed?
2) How can the description of the options confronting the high school senior be improved? Is it reasonable to ascribe zero cost and 374 SAT average score to the no-school option?
3) Are the twelve student classes which we used to represent the population of high school seniors sufficiently detailed?
4) Student aid has been ignored--how can its influence be taken into account?

5) At first blush, since cost and income enter the M-R model as a ratio, one can ignore the effects of inflation (since both may be assumed to increase in the same proportion). Are there more subtle effects which should be considered?

6) Are the effects of the "independence of irrelevant alternatives" feature of the model acceptable for reasonable changes in the options? Although many have argued to the contrary, the arguments are backed up by showing the ridiculous effects of drastic changes.

7) Is it possible to provide an adequate description of student choice with so few variables--cost, selectivity, ability, and income?

8) Will a static model ever be useful in providing answers to our basic questions?

Enrollment change model. An attempt to explain enrollment changes of institutions by relating them to the level of expenditures per student, tuition and fees, institutional size and selectivity was also made. The combined institutional data base used in attempting to calibrate such a model included various enrollment figures for fall, 1970, and fall, 1973, facility size figures for fall, 1970, instructional staff figures for fall, 1970, and financial information for fall, 1970, including expenditures per student and tuition charges. All of this data came from the HEGIS surveys. In addition, average freshman SAT and ACT test scores for a large number of institutions were taken from the ACE Institutional

Characteristics file. This computerized data base was supplemented with other information and edited and revised by hand when necessary. As required, the ACT scores were converted to equivalent SAT scores so that a more comprehensive selectivity stratification could be introduced.

A series of multiple linear regression analyses were performed on these data stratified in several ways--by category, by SAT range and by both category and SAT range. Eight distinct regression equations were evaluated for each group on institutions. These equations included various combinations of explanatory variables and were designed to test the influence of each upon enrollment change, while avoiding the problems of colinearity. A summary of some of the better results is given in Table 17. The table shows the independent variables included in the best equation (highest R^2) for each group of institutions, by SAT range and category. These, the "best" of our results, were disappointing--each equation included at least one coefficient of questionable significance. If they proved anything at all, it must be that enrollment changes do not correlate well at all with space, staff and other institutional variables. We shall refrain from adding to the plethora of literature which discusses, at length, the details of meaningless regression equations.

EVALUATION OF SCHOOL STRATEGIES

The private sector. If the private sector wishes to stem the decline in either its share of undergraduates or in absolute numbers of students, it can either step up recruitment of gifted students since, as a rule, it offers smaller classes and education in less gigantic institutions, or it can concentrate on attracting students who can afford, or are likely, to pay higher fees than those charged by public schools.

The implication of the model discussed in the previous section prompts one to believe that private schools are not likely to attract a large number of gifted students from schools with lower tuition, unless they meet the level of charges in the public schools. We have implied that the high marginal costs in schools likely to appeal to gifted students make it unfeasible for them to either drop their tuition to this low level, or even offer selective rebates to meet the charges elsewhere.

On the other hand, some private schools can probably attract students from the schools in that sector. The very best, national schools could very well increase their enrollments beyond projected levels. Two strategies to attract students are open to these national schools. The first is to recruit students of the same ability mix, but to restrict this recruiting to students who can pay tuitions that cover their marginal costs. Table 18 shows the results of this strategy, labelled "elitist" in the table. Over 70 per cent of the students recruited would come from

the public sector.

Another strategy open to the national private schools is to grow by enrolling an increasing proportion of students with lower ability from the population of students who already pay high tuition, and thus not be forced to offer any sizeable rebates. This is labelled the "income maximization" strategy. Should this strategy be followed, national schools must recruit all their new students from other expensive institutions in the private sector. However, the quality of the student body will decline somewhat; thus, if national schools increase their enrollments by some 20 per cent above our projections, the proportion of students with verbal SAT's over 600 could decline from the present 60 per cent of the freshman class to 52 per cent. In other words, these schools would become more homogeneous socially, while becoming more heterogeneous in terms of ability.

This second strategy is more likely to be successful, since a large number of lower-scoring students already apply to these schools. The simulation of Miller-Radner has also implied that the response of low-ability students to lowering selectivity barriers is more dramatic than that of high-ability students to lower tuition. (See Table 18.)

The expansion of the national schools especially under the income maximization strategy will affect other types of schools. Among the schools most likely to be affected are schools recruiting students

regionally with combined SAT scores of freshmen over 1,100 but under 1,200, those in the second selectivity level. These schools are likely to try to keep their enrollments at even keel, say at the 1975 levels, by adopting either an elitist or income maximization strategy. Table 19 below traces the consequences of attempting to maintain different levels.

The chain reaction of the expansion of national schools upon the more selective regional schools is likely to spur affected schools to attract students from other institutions. Regional private schools currently enroll some 40 per cent of the students who might be attracted to the national schools under the income maximization strategy. To make up their losses in enrollment and not lower the quality of their freshman class, regionals could then be forced to draw away most of the students with high ability in the remaining private schools. Most likely, three out of four students admitted to flesh out their enrollments would come from the private sector. By contrast, if regionals concentrate on recruiting students who are already paying high tuition, without too much regard for ability, two-thirds of their potential additional enrollment will be found in out-of-state students now attending public schools.

If national schools do not try to expand, but the regional schools try to keep their enrollments from declining by adopting an elitist strategy, which will not lower the ability levels of their freshmen further,

80 per cent of their additional students are likely to come from the less selective private schools. But, if they follow the income-maximization strategy, the bulk of their potential lies in attracting out-of-state students currently attending public sector schools.

It should be noted that the two types of private schools that may be expected to recruit students most successfully are not likely to "steal" too many students in the aggregate. If national schools expand aggressively and the better regional schools manage to keep their enrollments, only 107 thousand students will be diverted from the other schools. The loss of students to the public sector will be insignificant: probably no more than 2.5 per cent of all students enrolled.

The public sector. There is a much more serious possibility that the public sector will decide to increase its enrollments at the expense of the private sector. The plant capacity will be there, and the subsidies to students can be covered more easily by public schools, state legislatures willing, than by schools in the private sector. A simulation of enrollments in the public sector for 1985 is shown in Table 20. It is based on the following assumptions: (1) all public sector schools which were projected to grow between 1975 and 1985 will grow at the projected rates, and (2) other schools, by selectivity and category, will attempt to keep their enrollments at the 1975 levels.

These modest assumptions result in a growth in the public

sector, over and above our projections, of some 12 per cent. If it comes about, some 48 per cent of the enrollment in the private sector will be wiped out.

This scenario is far from unreasonable. If public schools remain as selective as they are, the students likely to remain in the private sector will be sufficient only to fill the vacancies in (1) high selectivity private schools, (2) and either 40 per cent of projected enrollments in other schools, or (3) it is conceivable that commuter schools in the private sector, which presumably serve areas where there is little competition from the public sector, may not be affected, and in that case, two-thirds of the private enrollment in regional and state schools will be wiped out. The possible expansion of schools in the public sector is well attuned to the ability distribution of the most vulnerable schools in the private sector. (See Table 20.)

The possibility of such a policy being implemented is quite high, since opposition to it by the general public will be minimal as long as the private post-secondary sector still caters to gifted students or to those undergraduate commuters who do not live within a short distance of public schools. The consequences of this policy are mind-boggling: some 70 per cent of private schools would be forced to close.

A number of strategies are open to state institutions in order to achieve these goals: more effective recruitment, judicious revision

of state scholarship plans, or even large decreases in tuition levels. The State of Wisconsin has advocated doing exactly that, and is planning to cut tuition and fees in public institutions by two-thirds.[21]

Another potential way of increasing public enrollments at the expense of the private sector is by dropping out-of-state tuitions. It is likely that national schools because of their prestige will not be affected as much as regional private schools by this move. Weaker regional schools which enroll at least 25 per cent of the students from out-of-state are more likely to lose students. For instance, if the same proportion of students who cross state lines were to opt for public education as students who attend schools in-state, some 20 per cent of students in regional schools would switch from the private to the public sector. The effect of this switch is not devastating for the private sector as a whole, which is likely to lose only a small proportion of its total enrollment. (See Table 21.)

A closer look at private recruitment patterns. Before going into greater depth about the policies and circumstances which may affect the level of recruitment of different types of institutions, it seems worthwhile to examine in some detail the circumstances which surround recruitment in the private sector. In order to perform this analysis, it was necessary to examine schools in greater detail than would be possible using the categories/selectivity classes discussed above.

Even when the universe of 2,000 odd post-secondary institutions was divided into 27 cells, by selectivity and geographical recruitment pattern, some cells were far from homogeneous, especially the more selective private schools. The fewer than 70 schools which comprise the national category, for instance, include: (1) leading schools with extremely high SAT's, (2) schools with somewhat less prestige, mostly liberal arts colleges, (3) quality "safety" schools which enroll candidates who have failed to get into the colleges in the above two categories, as well as students who prefer smaller institutions, and (4) prestige engineering schools where applications and enrollments are governed by the state of the market for engineers. This last group is not discussed below.

The two dozen leading national schools--the Ivy League universities, the Seven Sisters, and a few liberal arts schools--have one characteristic in common: their proportion of freshmen with SAT verbal scores below 500 is less than six per cent, apparently limited to students with special characteristics believed to be desirable (sportsmen, members of minorities, etc.). Even in these schools enrollment of freshmen with verbal SAT's of less than 500 increased from less than two per cent to five per cent of total enrollment between 1968 and 1972. They are sufficiently desirable that between 50 and 70 per cent of all freshmen accepted are likely to matriculate in the fall. (See Table 22.)

The admission policies and opportunities for recruitment do vary even in these schools. For instance, Harvard consciously reduced enrollments because of growing deficits. A few others, most notably Columbia and Chicago, lost some enrollment because they were located in decaying urban areas. Others, like Yale, Princeton, Bennington, and Vassar, increased their enrollments by becoming co-educational.

The second tier of national schools, e.g. Middlebury, Bucknell, Kenyon and Reed, have a much lower turn-up rate, between 40 and 45 per cent. Their selectivity is still quite high, and fewer than 10 per cent of their freshman class have verbal SAT's under 500.

The third tier of national schools generally has the same lower turn-up rates as the second group, though in some schools as few as 30 per cent of those admitted actually enroll in the fall. About 15 per cent of the freshmen they admit have verbal SAT's of less than 500. These are referred to as safety schools for gifted freshmen, and they include Lafayette, Union, Carleton, and the University of Rochester, etc.

Neither the admission practices nor the percentage of admittees likely to matriculate differ strikingly between the safety schools in the national category and the better regional schools. What does vary is the percentage of freshmen with low verbal scores. These regional schools could also be divided into two groups, by the proportion of freshmen who have verbal SAT scores of less than 500. One group has 15 to 20 per cent of the entering freshmen with these scores, and includes such institutions as St. Lawrence, Washington and Lee,

and Wheaton (Mass.). The other admits between 20 and 30 per cent of freshmen with scores below 500, and encompasses schools such as Gettysburg, Macalester, and Syracuse.

Two important conclusions can be drawn from this micro-analysis. The national schools, which are likely to have the least difficulty in attracting students, can target their student aid offers more effectively since they have the least chance of being refused. Other schools have great difficulty competing with each other by making selective scholarship offers because they never know who will or will not turn up in the fall.

The second important conclusion to be drawn from the analysis of application data is that all these schools have a ready reservoir of less-gifted students who apply to them and, if accepted, are more likely to turn up than the more gifted freshmen. For instance, the very best national schools could increase their enrollments by some 30 per cent if they admitted the same proportion of applicants with verbal SAT's under 600 as they do of those with over 600. The second tier of national schools could increase the size of the freshman class by nearly 20 per cent if they admitted the same proportion of applicants with verbal SAT's under 550 as those with SAT's over 550.

The other three groups of schools, those in the last group of national schools, could increase their freshmen enrollments by 10 per cent, and the selective regional schools could increase it by 14 or

15 per cent, if they admitted freshmen with verbal SAT's under 500 as often as those with higher SAT's. (Table 23)

An examination of the latest published admission figures (1970-71, very early in the period when college places were no longer in short supply) indicates that the majority of weaker regional schools, e.g. Allegheny, Macalester, Syracuse, etc., were already lowering their barriers and admitting students with lower SAT's to fill their classes. The strategy of maximizing income was being followed, rather than the elitist selective discount strategy.

LEVELS OF ENROLLMENTS AND DEFICITS

Only a small number of schools are likely to attempt to increase their enrollments in order to cut down deficits or the threat of deficits. A school that enrolls both graduate and undergraduate students but expends much higher resources on graduate students could balance its budget more easily by reducing the number of graduate students, while cutting faculty at a rate faster than the student body declines. To some extent, this policy has been followed by state schools which are reimbursed on a per-capita basis. The developments at the Berkeley campus of the University of California system are a case in point. There, the administration reduced the number of graduate places, and in order to continue attracting a full quota of undergraduates, it reduced admission requirements for both freshmen and transfer students.

A similar policy was adopted by Harvard, which took steps to reduce its faculty and then reduced graduate enrollments more than undergraduate enrollments. Only those schools which rely a great deal on their student fees have the incentive to expand enrollments, and then on condition that the concessions to the additional students are not sizeable.

As a general rule, schools with high endowment can afford to suffer high declines in enrollment when faced with increases in unit costs of instruction.

A school which recovers roughly 60 per cent of its costs from tuition and has other income equal to 40 per cent of costs, for instance, is not likely to incur a deficit if its enrollment declines, even if average costs per student increase somewhat. If enrollments decline 20 per cent and average costs per student increase ten per cent, its expenditures will be 88 per cent of the previous amount, and so will its income. Since its revenue from tuition is then 48 per cent in relation to total expenditures in the previous period, and its other income is unchanged, its accounts are roughly in balance. In other words, when schools with endowments are faced with increases in the relative costs of faculty, they are likely to balance their budgets by cutting down their enrollments rather than expanding them. This is precisely the policy adopted by Harvard.

By contrast, when a school which relies more heavily on student fees (with tuition covering 90 per cent of the outlays) is faced with a 20 per cent decline in enrollment and a ten per cent increase in student costs, it is likely to incur a 6 per cent deficit. It then can control its costs by cutting down the teacher/student ratio, since enrolling more students at current tuition rates will not cover its deficit at current levels of tuition. If its enrollments decreased by 10 per cent and its per-capita instruction costs increased by five per cent, for instance, its deficit would not be covered. If students had to be attracted by a reduction in tuition or selected rebates, so that the marginal students covered only 50 per cent of their instructional costs, the deficit would be increased rather than reduced over the lower-enrollment budget. The arithmetic underlying these calculations is shown in Table 24.

Thus, these schools are caught on the horns of a dilemma. If they are forced to balance their budgets by seeking out more students through keeping tuition rates down or offering more scholarships, the number of students per faculty member must be increased dramatically. The competitive position of a school in these circumstances is weakened. A more attractive alternative is to reduce entrance requirements, keep tuition up, and hope to fill up the roster.

We see very little hope for schools which were not selective to begin with. A number of them have placed recruitment in the hands of professional "student-hunters," others advertise in youth-oriented

publications, using such slogans as "come ski with us in Vermont," and one small school, where the enrollment declined by one-third in the past few years, had a streamer pulled by a plane over the Delaware beaches which read, "Undecided, call ---------- College."

The ineffectiveness of private non-selective schools in recruiting students gives us some confidence in the estimates of marginal cost presented above. Unless aid formulae change, we just do not believe that they can compete with the public sector.

The future policy of public sector schools is more difficult to forecast. The declines in enrollment there have generally occurred in the weaker liberal arts-teachers' colleges. On the average, enrollments in the principal schools of each college system have kept up with the trend in total public enrollments, and are not likely to be affected significantly. (See Table 25.) The weaker schools are saddled with a faculty that is oriented to teaching teachers, and according to some officials in State Departments of Education, nothing can be done short of closing them. Wisconsin did precisely that and discontinued a number of teacher-training institutions. It is also trying to attract more students from other schools to the state system by cutting tuition and fees.

Some of the new state systems, such as the one in New York, have particularly complicated problems. In New York a number of institutions which aspire to greatness were established and their plant is

still expanding. As their reputations grow, they could attract more out-of-state students, especially if tuitions for these students were lowered. State subsidies for the instruction of students on a per-capita basis, regardless of the origin of the student, represent a feasible way of drawing students away from other regional schools, or from state institutions in other states. In New York state, which has a scholarship program subsidizing the attendance of state residents at private schools, lowering out-of-state tuition to steal students from schools in other states could be politically viable and satisfy the ambition of the presidents of state schools.

CONCLUSIONS

It is not only difficult, but also dangerous to make predictions on the basis of past experience. The post-secondary sector has been expanding as far back as detailed statistics and memory stretch. In the distant past of the depression of the 1930's, declines in enrollments did occur. At that time the public sector was much less important, and state finances were strained by low employment levels. When enrollments decline again, for demographic reasons, in the next ten years, state finances may not be in such bad shape, and the public sector's response to losing students may be quite different.

The reactions of both public and private institutions to the declining enrollments and financial stringency experienced in the past

few years have been neither uniform, nor necessarily logical. Some state systems that were losing students allowed the major state university to expand while peripheral state liberal-arts colleges lost students. More recently, some states, most notably New Jersey, have decided to stabilize their in-state tuition while increasing out-of-state student charges. This decision was made without any consideration of the loss in the state institutions' competitive position in the search for students.

In the private sector, financial stringency has been taking its toll. The present slow-down in the economy has forced private schools to think about how to economize drastically--especially schools that relied heavily on their endowment incomes. For instance, Brown University has announced plans to cut its faculty by one-sixth, in order to balance its budget. Other private schools are increasing their tuition to catch up with increases in prices; next year, Yale will break the $4,000 level for tuition and fees. These decisions have been made imperative by the upward creep in faculty salaries, even though this still lags behind increases in the price level, and by the stickiness of other sources of funds. The impact of these decisions on student enrollments has not been closely studied. It is significant, though, that Columbia, which kept its tuition constant, did experience an increase in applications.

College and university administrators are badly served by the current state of theory on student choices. As a matter of fact,

most national and regional institutions are not served by this theory at all, since the models generally fail to deal in any detail with the students who cross state boundaries to go to school (fewer than 20 per cent). In the majority of cases, the admission offices and the administration must tread an uncertain path in trying to keep the academic levels of entering freshmen high while still accepting a sufficient number of potential students to keep enrollments at desired levels. It is not clear that lowering standards will prove to be a solution for these schools in the long run. The details of the recruitment process need to be investigated, and the reason for the success of policies of regional schools which have maintained high standards for their entering class need to be contrasted with that of schools which became less selective.

The identity crisis in the private sector is probably being postponed for a number of fortuitous reasons. Despite the fact that salaries are lagging and working conditions (measured by class size and number of hours of instruction) are deteriorating, the plethora of young, able, well-trained Ph.D.'s makes it possible even for schools with students of declining quality to obtain the services of young faculty with outstanding academic qualifications. They may not do a better job of teaching students than faculty with less illustrious credentials, but their presence must certainly flatter the egos of older faculty.

At present, the statistics certainly do not indicate that either

private or state systems will do anything wild to hurt one another. Of 16 states where both public and private enrollments declined, private enrollments declined more rapidly than public enrollments in 11 states, and more slowly in the remaining five states. In five additional states, public enrollments lost ground but private enrollments did not. In 18 other states (including the District of Columbia), private enrollments lost ground while public enrollment increased. No simple measures, such as the share of public enrollments in total enrollment, or the share of private enrollments in total enrollment, explain the changes. Generally, young state systems which were building up their capacity rapidly, as in New York State, did hurt the private schools. However, there were exceptions even to this rule, as both private and public enrollments increased in South Carolina.

The relative strengths, and in many instances the local reputations, of specific schools probably had more to do with their fortunes than more objective measures of quality. As we keep repeating, the post-secondary sector is truly fragmented and variegated, and few generalizations can be made about it. Hence, it is unlikely that any one set of policies can be used by either private or public institutions to control their levels of enrollment. The schools in the North-East will probably emphasize snow, those in the South will emphasize sun, and those in the Middle-West will find some other attribute, such as vocational training, in order to attract more students.

FOOTNOTES

1 All enrollment figures cited in this study are full-time equivalent enrollments.

2 The American Council on Education has estimated equivalent SAT and ACT scores for the post-secondary universe in 1970/71. In most instances the estimates appear to be reasonable. There are some exceptions. Most notable among these is Northeastern University with an imputed combined SAT score of over 1,200.

3 Apologies are in order for introducing another inelegant term for classifying colleges and universities. Unfortunately, more elegant words have already been preempted, such as type, classification, etc.

4 Martin M. Frankel, et al., Projections of Educational Statistics to 1982-83, 1973 Edition, D.H.E.W., U.S.O.E., N.C.E.S., Government Printing Office, Washington, D. C., 1974.

U. S. Bureau of the Census, Current Population Reports, Series P-25, No. 473, "Projections of School and College Enrollment: 1971 to 2000," January, 1972.

Professor Earl F. Cheit has informed us that the enrollment projections are being revised by the Carnegie group.

5 Joseph Froomkin, Changing Credential Objectives of Students in Post-Secondary Sector, December, 1974.

6 Joseph Froomkin, The Demand for Facilities in the Post-Secondary Sector, 1975 to 1990, August, 1974.

7 College and University Management, Annual Construction issue, June/July, 1970-1974.

8 The Economics and Financing of Higher Education in the United States, A Compendium of Papers, the Joint Economic Committee, Government Printing Office, Washington, D. C., 1969. C.f., Hans H. Jenny and G. Richard Wynn, "Short-Run Cost Variations in Institutions of Higher Learning," pp. 261-294, and Hans H. Jenny and G. Richard Wynn, "Expenditure Expectations for Private Colleges," pp. 440-466.

9 This statement is based on a comparison of a. National Education Association, Salaries Paid and Salary-Related Practices in Higher Education, 1971-1972, National Education Association Publication, 1972, and b. A.A.U.P., A.A.U.P. Bulletin, Summer, 1974, "Hard Times: Report on the Economic Status of the Profession 1973-74," along with unpublished N.E.A. surveys, and simulation of the expected proportion of faculty members by rank in Financial Prospects of Higher Education to 1990, Joseph Froomkin, November, 1972.

10 Froomkin, Financial Prospects, loc. cit.

11 Idem.

12 L. Miller and R. Radner, "Demand for Places: Summary of Results," draft of Chapter 3 of forthcoming book Demand and Supply in U. S. Higher Education (University of California at Berkeley, 1974).

13 Daryl E. Carlson, James Farmer, George B. Weathersby, A Framework for Analyzing Postsecondary Education Financing Policies, a staff report of The National Commission on the Financing of Postsecondary Education (Washington, D.C.: U. S. Government Printing Office, 1974), especially Appendix C.

14 Attributed to D. McFadden, "Conditional Logit Analysis of Qualitative Choice Behavior," In Zarembka, P., ed., Frontiers in Econometrics, (Academic Press, 1973).

15 Meir G. Kohn, Charles F. Manski, David S. Mundel, An Empirical Investigation of Factors Which Influence College Going Behavior, May 1974 (Mimeographed).

16 A notable exception is found in Edward W. Erickson, Watts Hill, Jr., Herbert S. Winokur, Jr., The College Going and College Choice Decisions: Summary of Findings and Conclusions from the North Carolina Data, Prepared for U. S. Department of Health, Education, and Welfare, under Contract OS-71-134, Washington, D. C., May 24, 1972. The authors present results based on increasing tuition for all options (in fact, public tuition increases more than private tuition) and need-based scholarships or student financial aid. Neither was to be considered within the context of the present study. The authors do give the coefficients of determination for the regressions upon which their calibration was based--they are disappointing, at best.

17 Stephen P. Dresch, Comprehensive Planning Models for Postsecondary Education: Current Feasibility and Potential Relevance, August 1, 1974 (Mimeographed).

18 Kenneth A. Simon and W. Vance Grant, Digest of Educational Statistics, 1971 Edition, DHEW Publication No. (OE) 72-45 (Washington, D. C.: U. S. Government Printing Office, 1972), p. 25, Table 28.

19 U. S. Bureau of the Census, Current Population Reports, Series P-20, No. 222, "School Enrollment: October 1970," U. S. Government Printing Office, Washington, D.C., 1971.

20 Anne M. Young, "The High School Class of 1972," Monthly Labor Review, U. S. Department of Labor, Bureau of Labor Statistics (June, 1973), Table 3, p. 29.

21 "National Report," Intellect, February 1975, p. 283.

FIGURE 1

APPLICATION OF THE MILLER-RADNER MODEL OF STUDENT CHOICE
MARKET SHARE VS. COST WITH CONSTANT SELECTIVITY

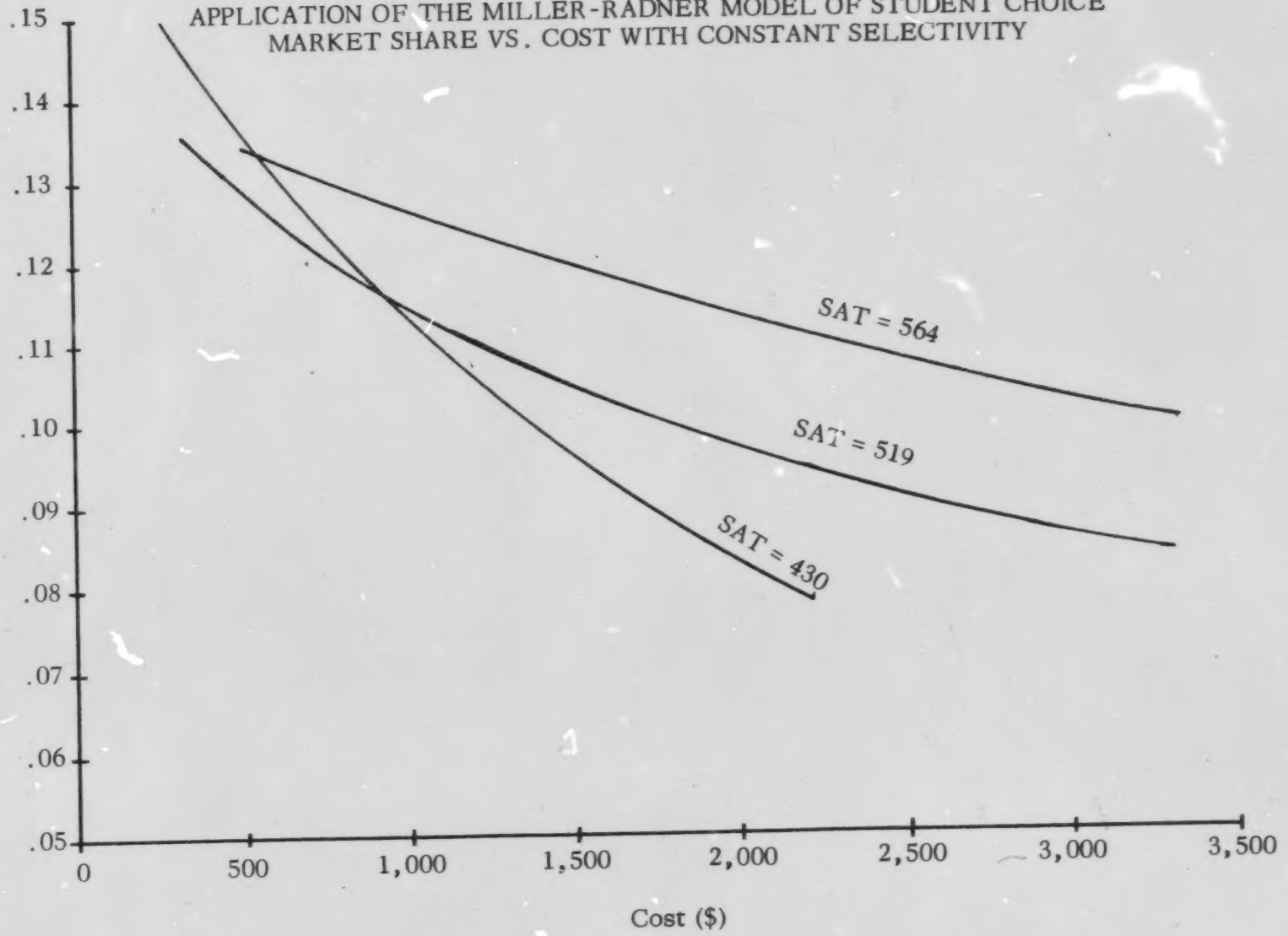

TABLE 1

NUMBER OF STATES WITH DECLINES AND INCREASES IN FULL TIME EQUIVALENT UNDERGRADUATE ENROLLMENT, BY CONTROL, 1970 TO 1973

	Increased Enrollment	Decreased Enrollment	Total States in Count
Public Enrollment	31	20	51[1]
Private Enrollment	17	33[1]	50[2]
Total Enrollment	30	21	51

[1] Total includes the District of Columbia.

[2] Excludes Wyoming, which has no private post-secondary institutions.

Source: Special tabulations, HEGIS Surveys V and VIII (1970, 1973).

TABLE 2

FULL TIME EQUIVALENT DEGREE CREDIT
UNDERGRADUATE ENROLLMENT BY
SELECTIVITY AND CONTROL,
1970, 1973

(thousands)

MEAN COMBINED SAT SCORES	1970	1973	Per Cent Change
Public			
1,200+	51	54	+5.9
1,100 - 1,199	342	364	+6.4
1,000 - 1,099	1,247	1,266	+1.5
900 - 999	919	943	+2.6
less than 900	1,350	1,479	+9.6
Total	3,909	4,106	+5.0
Private			
1,200+	173	178	+2.9
1,100 - 1,199	189	187	-1.1
1,000 - 1,099	421	400	-5.0
900 - 999	378	360	-4.8
less than 900	271	264	-2.6
Total	1,432	1,389	-3.0
Total			
1,200+	224	232	+3.6
1,100 - 1,199	531	551	+3.8
1,000 - 1,099	1,668	1,666	-0.1
900 - 999	1,297	1,302	+0.4
less than 900	1,621	1,744	+7.6
Total	5,341	5,495	+2.9

Source: Special tabulations, HEGIS Surveys V and VIII (1970, 1973).

TABLE 3

FULL TIME EQUIVALENT DEGREE CREDIT UNDERGRADUATE ENROLLMENT BY CATEGORY AND CONTROL, 1970, 1973

(thousands)

	1970	1973	Per Cent Change
Public			
National	13	14	+7.7
Regional	240	254	+5.8
State	1,722	1,746	+1.4
Commuter	1,934	2,092	+8.2
Total	3,909	4,106	+5.0
Private			
National	173	178	+3.6
Regional	753	718	-4.6
State	247	233	-5.7
Commuter	259	260	+0.4
Total	1,432	1,389	-3.0
Total			
National	186	192	+3.2
Regional	993	972	-2.1
State	1,969	1,978	+0.5
Commuter	2,193	2,353	+7.3
Total	5,341	5,495	+2.9

Source: Special tabulations, HEGIS Surveys V and VIII (1970, 1973).

TABLE 4

FULL TIME EQUIVALENT DEGREE CREDIT UNDERGRADUATE ENROLLMENT BY SELECTIVITY, CATEGORY, AND CONTROL, 1970, 1973

(thousands)

MEAN COMBINED SAT SCORES	Public			Private			Total		
	1970	1973	Per Cent Change	1970	1973	Per Cent Change	1970	1973	Per Cent Change
1,200+									
National	13	14	+7.7	173	178	+2.9	186	192	+3.2
Regional	-	-	-	-	-	-	-	-	-
State	38	41	+7.9	-	-	-	38	41	+7.9
Commuter	-	-	-	-	-	-	-	-	-
Total	51	55	+7.8	173	178	+2.9	224	233	+4.0
1,100 - 1,199									
National	-	-	-	-	-	-	-	-	-
Regional	35	39	+11.4	164	163	-0.6	199	202	+1.5
State	200	218	+9.0	15	14	-6.7	215	232	+7.9
Commuter	107	107	0.0	10	10	0.0	117	117	0.0
Total	342	364	+6.4	189	187	-1.1	531	551	+3.8
1,000 - 1,099									
National	-	-	-	-	-	-	-	-	-
Regional	159	167	+5.0	296	281	-5.1	455	448	-1.5
State	734	721	-1.8	66	63	-4.5	800	784	-2.0
Commuter	354	378	+6.8	59	56	-3.4	413	434	+5.3
Total	1,247	1,266	+1.5	421	400	-4.8	1,668	1,666	-0.1

TABLE 4 (Cont'd)

FULL TIME EQUIVALENT DEGREE CREDIT UNDERGRADUATE ENROLLMENT BY SELECTIVITY, CATEGORY, AND CONTROL, 1970, 1973

(thousands)

MEAN COMBINED SAT SCORES	Public			Private			Total		
	1970	1973	Per Cent Change	1970	1973	Per Cent Change	1970	1973	Per Cent Change
900 - 999									
National	-	-	-	-	-	-	-	-	-
Regional	46	48	+4.3	216	204	-5.6	262	252	-3.8
State	493	485	-1.6	93	91	-2.2	586	576	-1.7
Commuter	380	410	+7.9	69	65	-5.8	449	475	+5.8
Total	919	943	+2.6	378	360	-4.8	1,297	1,303	+0.5
Less Than 900									
National	-	-	-	-	-	-	-	-	-
Regional	-	-	-	77	70	-9.1	77	70	-9.1
State	257	280	+8.9	73	64	-12.3	330	344	+4.2
Commuter	1,093	1,199	+9.7	121	129	+6.6	1,214	1,328	+9.4
Total	1,350	1,479	+9.6	271	263	-3.0	1,621	1,742	+7.5

Source: Special tabulations, HEGIS Surveys V and VIII (1970, 1973).

TABLE 5

NON-DEGREE CREDIT ENROLLMENTS BY SELECTIVITY, CATEGORY AND CONTROL, 1970, 1973
(thousands of FTE students)

MEAN COMBINED SAT SCORES	Public				
	National	Regional	State	Commuter	Total
1,200+					
1970	-	-	-	-	-
1973	-	-	-	-	-
1,100 - 1,199					
1970	-	-	2	-	3
1973	-	-	1	1	2
1,000 - 1,099					
1970	-	1	5	2	8
1973	-	2	6	2	9
900 - 999					
1970	-	-	4	8	13
1973	-	1	6	17	24
Less Than 900					
1970	-	1	17	374	391
1973	-	1	28	592	621
Total					
1970	-	2	28	384	415
1973	-	4	41	612	656

TABLE 5 (Cont'd)

NON-DEGREE CREDIT ENROLLMENTS BY SELECTIVITY, CATEGORY AND CONTROL, 1970, 1973
(thousands of FTE students)

MEAN COMBINED SAT SCORES	Private				
	National	Regional	State	Commuter	Total
1,200+					
1970	2	-	-	-	2
1973	1	-	-	-	1
1,100 - 1,199					
1970	-	-	-	-	-
1973	-	-	-	-	1
1,000 - 1,099					
1970	-	2	-	-	3
1973	-	2	-	-	2
900 - 999					
1970	-	2	2	2	6
1973	-	2	3	3	8
Less Than 900					
1970	-	2	2	8	12
1973	-	3	4	23	30
Total					
1970	2	6	4	10	23
1973	1	7	7	26	41

TABLE 5 (Cont'd)

NON-DEGREE CREDIT ENROLLMENTS BY SELECTIVITY, CATEGORY AND CONTROL, 1970, 1973
(thousands of FTE students)

MEAN COMBINED SAT SCORES	Total[1]				
	National	Regional	State	Commuter	Total
1,200+					
1970	2	-	-	-	2
1973	1	-	-	-	1
1,100 - 1,199					
1970	-	-	2	-	3
1973	-	-	1	1	3
1,000 - 1,099					
1970	-	3	5	2	11
1973	-	4	6	2	11
900 - 999					
1970	-	2	6	10	19
1973	-	3	9	20	32
Less Than 900					
1970	-	3	19	383	403
1973	-	4	32	615	651
Total					
1970	2	8	33	395	438
1973	1	11	48	637	698

[1] Totals may not add up due to rounding.

Source: Special tabulations, HEGIS Surveys V and VIII (1970, 1973).

TABLE 6

PROJECTIONS OF FULL TIME EQUIVALENT DEGREE CREDIT AND NON-DEGREE CREDIT UNDERGRADUATE ENROLLMENTS BY SELECTIVITY, CATEGORY, AND CONTROL, 1970, 1975, 1980, 1985
(thousands)

MEAN COMBINED SAT SCORES	Degree Credit Undergraduates				
	Public				
	National	Regional	State	Commuter	Total
1,200+					
1970-71	13	-	38	-	51
1975-76	14	-	44	-	58
1980-81	13	-	44	-	57
1985-86	12	-	45	-	57
1,100 - 1,199					
1970-71	-	35	200	107	342
1975-76	-	44	234	108	386
1980-81	-	49	240	96	385
1985-86	-	54	245	84	383
1,000 - 1,099					
1970-71	-	159	734	354	1,247
1975-76	-	176	723	400	1,299
1980-81	-	170	623	396	1,189
1985-86	-	163	534	389	1,086
900 - 999					
1970-71	-	46	493	380	919
1975-76	-	50	487	433	970
1980-81	-	48	422	432	902
1985-86	-	46	362	428	836
Less Than 900					
1970-71	-	-	257	1,093	1,350
1975-76	-	-	298	1,297	1,595
1980-81	-	-	302	1,348	1,650
1985-86	-	-	305	1,390	1,695
Total					
1970-71	13	240	1,722	1,934	3,909
1975-76	14	270	1,786	2,238	4,308
1980-81	13	267	1,631	2,272	4,183
1985-86	12	263	1,491	2,291	4,057

TABLE 6 (Cont'd)

PRO[illegible]TIONS OF FULL TIME EQUIVALENT DEGREE CREDIT
[illegible]ND NON-DEGREE CREDIT UNDERGRADUATE
[illegible]ROLLMENTS BY SELECTIVITY, CATEGORY,
AND CONTROL, 1970, 1975, 1980, 1985
(thousands)

MEAN COMBINED SAT SCORES	Degree Credit Undergraduates				
	Private				
	National	Regional	State	Commuter	Total
1,200+					
1970-71	174	-	-	-	174
1975-76	181	-	-	-	181
1980-81	174	-	-	-	174
1985-86	174	-	-	-	174
1,100 - 1,199					
1970-71	-	164	15	10	189
1975-76	-	161	14	10	185
1980-81	-	145	11	9	165
1985-86	-	142	9	9	160
1,000 - 1,099					
1970-71	-	296	66	59	421
1975-76	-	270	62	54	386
1980-81	-	225	53	45	323
1985-86	-	189	48	40	277
900 - 999					
1970-71	-	216	93	69	378
1975-76	-	196	86	64	346
1980-81	-	162	77	53	292
1985-86	-	141	70	47	258
Less Than 900					
1970-71	-	77	73	121	271
1975-76	-	66	59	135	260
1980-81	-	52	43	137	232
1985-86	-	43	33	147	223
Total					
1970-71	174	753	247	259	1,432
1975-76	181	693	221	263	1,358
1980-81	174	584	184	244	1,186
1985-86	174	515	160	243	1,092

TABLE 6 (Cont'd)

PROJECTIONS OF FULL TIME EQUIVALENT DEGREE CREDIT AND NON-DEGREE CREDIT UNDERGRADUATE ENROLLMENTS BY SELECTIVITY, CATEGORY, AND CONTROL, 1970, 1975, 1980, 1985
(thousands)

MEAN COMBINED SAT SCORES	Degree Credit Undergraduates				
	Total				
	National	Regional	State	Commuter	Total
1,200+					
1970-71	187	-	38	-	225
1975-76	195	-	44	-	239
1980-81	187	-	44	-	231
1985-86	186	-	45	-	231
1,100 - 1,199					
1970-71	-	199	215	117	531
1975-76	-	205	248	118	571
1980-81	-	194	251	105	550
1985-86	-	196	254	93	543
1,000 - 1,099					
1970-71	-	455	800	413	1,668
1975-76	-	446	785	454	1,685
1980-81	-	395	676	441	1,512
1985-86	-	352	582	429	1,363
900 - 999					
1970-71	-	262	586	449	1,297
1975-76	-	246	573	497	1,316
1980-81	-	210	499	485	1,194
1985-86	-	187	432	475	1,094
Less Than 900					
1970-71	-	77	330	1,214	1,621
1975-76	-	66	357	1,432	1,855
1980-81	-	52	345	1,485	1,882
1985-86	-	43	338	1,537	1,918
Total					
1970-71	187	993	1,969	2,193	5,341
1975-76	195	963	2,007	2,501	5,666
1980-81	187	851	1,815	2,516	5,369
1985-86	186	778	1,651	2,534	5,149

TABLE 6 (Cont'd)

PROJECTIONS OF FULL TIME EQUIVALENT DEGREE CREDIT AND NON-DEGREE CREDIT UNDERGRADUATE ENROLLMENTS BY SELECTIVITY, CATEGORY, AND CONTROL, 1970, 1975, 1980, 1985
(thousands)

MEAN COMBINED SAT SCORES	Non-Degree Credit Undergraduates				
	Public				
	National	Regional	State	Commuter	Total
900 - 999					
1970-71	-	-	-	11	11
1975-76	-	-	-	20	20
1980-81	-	-	-	25	25
1985-86	-	-	-	27	27
Less Than 900					
1970-71	-	-	18	336	354
1975-76	-	-	34	619	653
1980-81	-	-	41	760	801
1985-86	-	-	46	842	888
Total					
1970-71	-	-	18	347	365
1975-76	-	-	34	639	673
1980-81	-	-	41	785	826
1985-86	-	-	46	669	715
	Private				
900 - 999					
1970-71	-	1	1	1	3
1975-76	-	1	1	1	3
1980-81	-	2	2	2	6
1985-86	-	2	2	2	6
Less Than 900					
1970-71	-	1	1	7	9
1975-76	-	2	2	13	17
1980-81	-	2	3	16	21
1985-86	-	3	3	17	23
Total					
1970-71	-	2	2	8	12
1975-76	-	3	3	14	20
1980-81	-	4	5	18	27
1985-86	-	5	5	19	29

TABLE 6 (Cont'd)

PROJECTIONS OF FULL TIME EQUIVALENT DEGREE CREDIT AND NON-DEGREE CREDIT UNDERGRADUATE ENROLLMENTS BY SELECTIVITY, CATEGORY, AND CONTROL, 1970, 1975, 1980, 1985
(thousands)

MEAN COMBINED SAT SCORES	Non-Degree Credit Undergraduates				
	Total				
	National	Regional	State	Commuter	Total
900 - 999					
1970-71	-	1	1	12	14
1975-76	-	1	1	21	23
1980-81	-	2	2	27	31
1985-86	-	2	2	29	33
Less Than 900					
1970-71	-	1	19	343	363
1975-76	-	2	36	632	670
1980-81	-	2	44	776	822
1985-86	-	3	49	859	911
Total					
1970-71	-	2	20	355	377
1975-76	-	3	37	653	693
1980-81	-	4	46	803	853
1985-86	-	5	51	688	744

Source: Special tabulations, HEGIS Surveys V and VIII (1970, 1973).

TABLE 7

DISTRIBUTION OF ENROLLED STUDENTS ACCORDING TO VERBAL SAT SCORES BY SELECTIVITY

(per cent)

MEAN COMBINED SAT SCORES	SAT-V 600+	SAT-V 500 - 600	SAT-V Under 500	Total
1,200+	60	30	10	100
1,100 - 1,199	29	41	30	100
1,000 - 1,099	14	37	49	100
900 - 999	9	30	61	100
Less Than 900	4	14	82	100

Source: Douglas D. Dillenbeck and Sue Wetzel, ed., The College Handbook, Part 2: Tables and Maps, College Entrance Examination Board, New York, 1972.

TABLE 8

DISTRIBUTION OF FULL TIME EQUIVALENT DEGREE CREDIT UNDERGRADUATES BY CONTROL, SELECTIVITY, 1970 TUITION, AND VERBAL SAT SCORE FOR 1970, 1985

(per cent of total degree credit enrollment)

MEAN SAT-V	MEAN COMBINED SAT SCORES	1970		1985		Private		Public
		Public	Private	Public	Private	Tuition $2,000+	Tuition $1,000-$2,000	Tuition $1,000+
600+	1,200+	0.0	0.4	0.7	2.0	2.0	0.0	0.1
	1,100 - 1,199	0.8	0.5	2.2	0.9	0.6	0.3	0.7
	1,000 - 1,099	3.0	1.0	2.9	0.8	0.2	0.6	0.5
	900 - 999	2.2	0.9	1.5	0.5	0.1	0.4	0.6
	Less Than 900	3.2	0.7	1.3	0.2	0.0	0.2	0.0
	Total	9.2	3.5	8.6	4.4	2.9	1.5	1.9
500-600	1,200+	0.0	0.9	0.3	1.0	1.0	0.0	0.2
	1,100 - 1,199	1.9	1.0	3.1	1.3	1.0	0.3	1.7
	1,000 - 1,099	6.8	2.3	7.8	2.0	0.6	1.4	3.0
	900 - 999	5.0	2.1	4.9	1.5	0.3	1.2	1.2
	Less Than 900	7.4	1.5	4.6	0.6	0.0	0.6	0.9
	Total	21.1	7.8	20.7	6.4	2.9	3.5	7.0
Below 500	1,200+	0.1	1.9	0.1	0.4	0.4	0.0	0.1
	1,100 - 1,199	3.7	2.0	2.2	0.9	0.7	0.2	1.7
	1,000 - 1,099	13.6	4.6	10.3	2.6	0.8	1.8	4.0
	900 - 999	10.0	4.1	9.9	3.1	0.5	2.6	2.6
	Less Than 900	14.7	3.0	27.0	3.5	0.0	3.5	4.3
	Total	42.1	15.6	49.5	10.5	2.4	8.1	12.7

TABLE 8 (Cont'd)

DISTRIBUTION OF FULL TIME EQUIVALENT DEGREE CREDIT UNDERGRADUATES BY CONTROL, SELECTIVITY, 1970 TUITION, AND VERBAL SAT SCORE FOR 1970, 1985

(per cent of total degree credit enrollment)

MEAN SAT-V	MEAN COMBINED SAT SCORES	1970		1985		Private		Public
		Public	Private	Public	Private	Tuition $2,000+	Tuition $1,000-$2,000	Tuition $1,000+
Total	1,200+	0.1	3.2	1.1	3.4	3.4	0.0	0.4
	1,100 - 1,199	6.4	3.5	7.5	3.1	2.3	0.8	4.1
	1,000 - 1,099	23.4	7.9	21.0	5.4	1.6	3.8	7.5
	900 - 999	17.2	7.1	16.3	5.1	0.9	4.2	4.4
	Less Than 900	25.3	5.1	32.9	4.3	0.0	4.3	5.2
	Total	73.2	26.8	78.8*	21.3*	8.2	13.1	21.6

* Figures do not add up to 100.0 due to rounding error.

Source: HEGIS and Table 2.

TABLE 9

CLASS SPACE PER FULL TIME EQUIVALENT STUDENT, 1970, 1985

Public - SAT	National	Regional	State	Commuter	Total	Estimate 1985	Capacity as Per Cent of Enrollment
1,200+	16.45	-	10.59	-	12.08	12.0	141
1,100 - 1,199	-	12.46	12.47	13.46	12.78	15.0	176
1,000 - 1,099	-	14.60	12.12	8.81	11.50	13.3	156
900 - 999	-	18.54	14.85	10.18	13.10	14.6	172
less than 900	-	-	21.50	15.54	16.68	13.0	152
Total					13.79	15.2	158
Private - SAT							
1,200+	19.71	-	-	-	19.71	24.4	286
1,100 - 1,199	-	19.15	15.91	16.38	18.75	23.0	270
1,000 - 1,099	-	20.15	22.45	13.08	19.52	23.9	281
900 - 999	-	22.73	25.16	14.24	21.78	27.0	317
less than 900	-	28.58	27.29	34.87	31.04	40.2	472
Total					22.22	25.9	330

Source: Special tabulations, HEGIS Surveys V and VIII (1970, 1973).

TABLE 10

RATIO OF STUDENTS TO FACULTY MEMBERS BY CONTROL AND SELECTIVITY OF SCHOOL

MEAN COMBINED SAT SCORES	Public	Private	Possible Increase in Enrollment: Public	Possible Increase in Enrollment: Private
	(students per instructor)		(per cent of enrollment)	
1,200+	16.8	12.6	?	18
1,100 - 1,199	17.1	15.7	7	13
1,000 - 1,099	19.1	18.1	13	8
900 - 999	20.5	17.8	14	16
less than 900	16.6	16.2	16	11

Source: HEGIS, 1970.

TABLE 11

COST, TUITION, PUPIL/TEACHER RATIOS, MARGINAL COST, AVERAGE SALARIES, RATIO OF PRIVATE MARGINAL COST TO PUBLIC TUITION FOR POST-SECONDARY INSTITUTIONS, BY CATEGORY, SELECTIVITY, AND CONTROL, 1970

	Public				
Cost (in dollars)	1,200+	1,100 - 1,199	1,000 - 1,099	900 - 999	Less Than 900
National	2,217	-	-	-	-
Regional	-	1,751	1,605	1,154	2,126
State	2,225	2,130	1,669	1,324	1,576
Commuter	-	1,706	1,543	1,415	1,574
Tuition (in dollars)					
National	629	-	-	-	-
Regional	-	537	504	424	684
State	632	622	515	381	385
Commuter	-	574	425	366	436
Pupil/Teacher Ratio					
National	16.5	-	-	-	-
Regional	-	15.2	17.2	21.1	15.9
State	16.8	15.7	18.0	19.6	17.1
Commuter	-	17.6	19.9	20.2	15.2
Marginal Cost (in dollars)					
National	998	-	-	-	-
Regional	-	788	722	519	957
State	1,001	959	751	596	709
Commuter	-	768	694	637	708
Average Salaries (in dollars)					
National	15,730	-	-	-	-
Regional	-	11,445	11,871	10,470	n.a.
State	16,073	14,380	12,918	11,159	11,588
Commuter	-	12,911	13,203	12,291	10,288

TABLE 11 (Cont'd)

COST, TUITION, PUPIL/TEACHER RATIOS, MARGINAL COST, AVERAGE SALARIES, RATIO OF PRIVATE MARGINAL COST TO PUBLIC TUITION FOR POST-SECONDARY INSTITUTIONS, BY CATEGORY, SELECTIVITY, AND CONTROL, 1970

	Private				
Cost (in dollars)	1,200+	1,100 - 1,199	1,000 - 1,099	900 - 999	Less Than 900
National	2,770	-	-	-	-
Regional	-	2,172	1,713	1,774	1,850
State	-	1,760	1,775	1,603	1,734
Commuter	-	1,609	1,422	1,334	1,491
Tuition (in dollars)					
National	2,562	-	-	-	-
Regional	-	2,279	768	1,578	1,375
State	-	2,018	1,768	1,363	1,191
Commuter	-	1,817	1,823	1,938	1,180
Pupil/Teacher Ratio					
National	11.5	-	-	-	-
Regional	-	13.7	17.2	15.1	15.1
State	-	20.2	17.3	16.0	14.3
Commuter	-	19.3	22.5	22.4	15.6
Marginal Cost (in dollars)					
National	1,053	-	-	-	-
Regional	-	825	651	674	703
State	-	669	675	609	659
Commuter	-	611	540	507	567
Average Salaries (in dollars)					
National	11,468	-	-	-	-
Regional	-	10,712	10,607	9,643	10,057
State	-	12,799	11,055	9,233	8,927
Commuter	-	11,179	11,518	10,757	8,373

TABLE 11 (Cont'd)

COST, TUITION, PUPIL/TEACHER RATIOS, MARGINAL COST, AVERAGE SALARIES, RATIO OF PRIVATE MARGINAL COST TO PUBLIC TUITION FOR POST-SECONDARY INSTITUTIONS, BY CATEGORY, SELECTIVITY, AND CONTROL, 1970

Private Marginal Cost/Public Tuition	1,200+	1,100 - 1,199	1,000 - 1,099	900 - 999	Less Than 900
National	1.67	-	-	-	-
Regional	-	1.54	1.29	1.39	1.03
State	-	1.08	1.31	1.60	1.71
Commuter	-	1.06	1.27	1.39	1.30

Source: Special tabulations, HEGIS Surveys V and VIII (1970, 1973).

TABLE 12

PROPORTION OF HIGH SCHOOL SENIORS DERIVED FROM SCOPE STUDY AT SAT SCORE AND FAMILY INCOME USED IN MILLER-RADNER MODEL

Ability (SAT Score)	Family Income		
	$6,000	$12,000	$18,000
375	.142	.044	.008
475	.140	.081	.017
575	.117	.094	.026
650	.122	.153	.056

Source: Derived from L. Miller and R. Radner, "Demand for Places: Summary of Results," draft of Chapter 3 of forthcoming book Demand and Supply in U. S. Higher Education (University of California at Berkeley, 1974), Table 2.

TABLE 13

PROPORTION OF HIGH SCHOOL SENIORS CHOOSING VARIOUS ALTERNATIVES AFTER GRADUATION BY COST OF OPTION AND SELECTIVITY LEVEL IN MILLER-RADNER MODEL--"ILLUSTRATIVE EXAMPLE" CASE

Option	Cost ($)	Selectivity (SAT)	Weighted Probability
1	0	374	0.189
2	290	430	0.121
3	400	519	0.104
4	540	564	0.111
5	2,200	430	0.063
6	1,300	519	0.087
7	1,440	564	0.099
8	3,200	500	0.053
9	3,200	540	0.076
10	3,200	625	0.096

Source: See text.

TABLE 14

RESULTS OF THE MILLER-RADNER MODEL OF STUDENT CHOICE IN SIMULATING RESPONSE TO A REDUCTION IN COST FOR PRIVATE COLLEGES AND UNIVERSITIES (IN OPTION 8)

(proportion of students enrolled)

	Old			New		
Option	Cost	Selectivity	Share	Cost	Selectivity	Share
1	0	374	.233	0	374	.232
2	290	430	.149	290	430	.148
3	400	519	.128	400	519	.127
4	540	564	.136	540	564	.136
5	2,200	430	.078	2,200	430	.077
6	1,300	519	.108	1,300	519	.107
7	1,440	564	.122	1,440	564	.122
8	3,200	500	.066	2,700	500	.071
9	3,200	540	.094	3,200	540	.093
10	3,200	625	.119	3,200	625	.118

Source: See text.

TABLE 15

RESULTS OF THE MILLER-RADNER MODEL OF STUDENT CHOICE IN SIMULATING RESPONSE TO A REDUCTION IN SELECTIVITY OF PRIVATE COLLEGES AND UNIVERSITIES IN OPTION 8

(proportion of students enrolled)

	Old			New		
Option	Cost	Selectivity	Share	Cost	Selectivity	Share
1	0	374	.233	0	374	.222
2	290	430	.149	290	430	.144
3	400	519	.128	400	519	.130
4	540	564	.136	540	564	.141
5	2,200	430	.078	2,200	430	.076
6	1,300	519	.108	1,300	519	.109
7	1,440	564	.122	1,440	564	.126
8	3,200	500	.066	3,200	430	.057
9	3,200	540	.094	3,200	540	.096
10	3,200	625	.119	3,200	625	.122

Source: See text.

TABLE 16

RESULTS OF THE MILLER-RADNER MODEL OF STUDENT CHOICE WEIGHTED PROBABILITY OF CHOICE OF VARIOUS ENROLLMENT ALTERNATIVES FOR "ILLUSTRATIVE EXAMPLE" AND "CALIBRATION SAMPLE" CASES

(proportion of students enrolled)

	"Illustrative Example"			"Calibration Sample"		
Option	Cost	Selectivity	Weighted Probability	Cost	Selectivity	Weighted Probability
1	0	374	.189	0	374	.177
2	200	430	.121	402	426	.114
3	400	519	.104	487	500	.095
4	540	564	.111	542	562	.124
5	2,200	430	.063	1,608	445	.074
6	1,300	519	.087	1,700	496	.073
7	1,440	564	.099	1,463	562	.111
8	3,200	500	.053	2,575	426	.056
9	3,200	540	.076	2,914	518	.071
10	3,200	625	.096	3,370	573	.103

Source: See text.

TABLE 17

COEFFICIENTS OF DETERMINATION AND INDEPENDENT VARIABLES INCLUDED IN BEST PREDICTIVE EQUATIONS OF CHANGE IN ENROLLMENT, FALL 1970 TO FALL 1973

Institutional Group	Independent Variables*	R^2	Number of Observations
SAT 1,200+			
All	1, 4, 6, 7, 8	.21	60
SAT 1,100 - 1,199			
Regional	2, 3, 6, 7, 8	.14	78
SAT 1,000 - 1,099			
Regional	2, 3, 6, 7	.10	178
State			
All	1, 4, 6, 7, 8	.12	102
Public Only	1, 4, 6, 7, 8	.26	52
Commuter			
All	2, 3, 4, 5	.44	40
Public Only	2, 3, 4, 5	.68	22
SAT 900 - 999			
Regional	2, 3, 6, 7, 8	.12	125
State			
All	2, 3, 4, 5	.14	67
Public Only	1, 4, 6, 7, 8	.31	23
Commuter			
All	1, 4, 6, 7, 8	.35	42
Public Only	1, 4, 6, 7, 8	.44	30
SAT Less Than 900			
Regional	2, 3, 6, 7, 8	.13	150
State			
All	2, 3, 6, 7, 8	.07	249
Public Only	2, 3, 6, 7, 8	.20	143
Commuter			
All	2, 3, 4, 5	.20	202
Public Only	2, 3, 4, 5	.17	179

TABLE 17 (Cont'd)

COEFFICIENTS OF DETERMINATION AND INDEPENDENT VARIABLES INCLUDED IN BEST PREDICTIVE EQUATIONS OF CHANGE IN ENROLLMENT, FALL 1970 TO FALL 1973

* Independent Variables are:

1. Institutional Size measured by FTE degree-credit undergraduates plus non-degree credit students in fall 1970.
2. Institutional Size Group.
3. Institutional Selectivity measured by average freshman SAT score.
4. Tuition and Fees.
5. Instructional expenditure per student.
6. Subsidy measured by instructional expenditures per student less undergraduate tuition and fees.
7. Staff Ratio measured by FTE Instructional Staff per FTE Standard Undergraduate Student.
8. Excess student capacity based on total non-residential space and our space standards by type and control.

Source: See text.

TABLE 18

IMPACT OF HYPOTHETICAL EXPANSION OF ELITE PRIVATE SCHOOLS, 1985

(thousands of FTE undergraduate students)

	This Study Projected	Possibility 1	Possibility 2
Number Enrolled	174	205	235
Per Cent of Total Enrollment	3.4	4.0	4.6
Difference From Number	-	31	61
Projected Per Cent	-	0.6	1.2

	Sources of Students			
	Strategy		Strategy	
	Elitist	Income Maximization	Elitist	Income Maximization
SAT-V 600+	18.5	6.0	36.6	12.0
Public	14.2	-	28.1	-
Private	4.3	6.0	8.5	12.0
SAT-V 500 - 600	9.3	12.0	18.3	24.0
Public	7.3	-	14.5	-
Private	2.0	12.0	3.8	24.0
SAT-V Below 500	3.2	13.0	6.1	25.0
Public	2.7	-	5.1	-
Private	0.5	13.0	1.0	25.0

TABLE 18 (Cont'd)

IMPACT OF HYPOTHETICAL EXPANSION OF ELITE PRIVATE SCHOOLS, 1985

(thousands of FTE undergraduate students)

	This Study Projected	Sources of Students			
		Strategy		Strategy	
		Elitist	Income Maximization	Elitist	Income Maximization
Total		31.0	31.0	61.0	61.0
Public		24.2	-	47.7	-
Private		6.8	31.0	13.3	61.0
Total Enrollment					
SAT-V 600+	104	122.5	110.0	140.6	122.0
SAT-V 500 - 600	52	61.3	64.0	70.3	76.0
SAT-V Under 500	18	21.2	31.0	24.1	37.0
Per Cent Distribution					
Total Enrollment	100.0	100.0	100.0	100.0	100.0
SAT-V 600+	59.8	59.8	53.7	59.8	51.9
SAT-V 500 - 600	29.9	29.9	31.2	29.9	32.3
SAT-V Under 500	10.3	10.3	15.1	10.3	15.8

Source: See Table 8.

TABLE 19

IMPACT OF HYPOTHETICAL EXPANSION OF BETTER PRIVATE REGIONAL SCHOOLS, 1985

	No Expansion of Elite Schools	Possibility 1
	This Study Projected	
Number Enrolled	142	164
Per Cent Total	2.8	3.2
Difference From Number Projected	-	22
Per Cent	-	.43

	Sources of Students	
	Strategy	
	Elitist	Income Maximization
SAT-V 600+	6.6	1.8
Public	5.2	0.8
Private	1.4	1.0
SAT-V 500 - 600	8.8	6.3
Public	7.1	3.5
Private	1.7	2.8
SAT-V Below 500	6.6	13.9
Public	5.5	7.5
Private	1.1	6.4

TABLE 19 (Cont'd)

IMPACT OF HYPOTHETICAL EXPANSION OF BETTER PRIVATE REGIONAL SCHOOLS, 1985

	No Expansion of Elite Schools		
	This Study Projected	Sources of Students Strategy	
		Elitist	Income Maximization
Total		22.0	22.0
Public		17.8	11.8
Private		4.2	10.2
Total Enrollment			
SAT-V 600+	41.2	47.8	43.0
SAT-V 500 - 600	58.2	67.0	64.5
SAT-V Under 500	42.6	49.2	56.5
Per Cent Distribution			
Total Enrollment			
SAT-V 600+	29.0	29.0	26.2
SAT-V 500 - 600	41.0	41.0	39.3
SAT-V Under 500	30.0	30.0	34.5

TABLE 19 (Cont'd)

IMPACT OF HYPOTHETICAL EXPANSION OF BETTER PRIVATE REGIONAL SCHOOLS, 1985

	This Study Projected (1)	This Study Projected (2)	After Expansion of Elite Schools: Possibility 1	After Expansion of Elite Schools: Possibility 2
Number Enrolled	130	118	164	164
Per Cent Total	2.5	2.3	3.2	3.2
Difference From Number	-	-	34	46
Projected Per Cent	-	-	.66	.90

	Sources of Students: Strategy			
	Elitist	Income Maximization	Elitist	Income Maximization
SAT-V 600+	10.2	2.8	13.8	3.8
Public	8.1	1.2	10.9	1.6
Private	2.1	1.6	2.9	2.2
SAT-V 500 - 600	13.6	9.8	18.4	13.2
Public	11.0	5.4	14.9	7.3
Private	2.6	4.4	3.5	5.9
SAT-V Below 500	10.2	21.4	13.8	29.0
Public	8.5	11.6	11.6	15.7
Private	1.7	9.8	2.2	13.3

TABLE 19 (Cont'd)

IMPACT OF HYPOTHETICAL EXPANSION OF BETTER PRIVATE REGIONAL SCHOOLS, 1985

	This Study (1)	Projected (2)	After Expansion of Elite Schools: Sources of Students: Strategy: Elitist	After Expansion of Elite Schools: Sources of Students: Strategy: Income Maximization	After Expansion of Elite Schools: Sources of Students: Strategy: Elitist	After Expansion of Elite Schools: Sources of Students: Strategy: Income Maximization
Total			34.0	34.0	46.0	46.0
Public			27.6	18.2	37.4	24.6
Private			6.4	15.8	8.6	21.4
Total Enrollment						
SAT-V 600+	37.7	34.2	47.9	40.5	48.0	38.0
SAT-V 500 - 600	53.3	48.4	66.9	63.1	66.8	61.6
SAT-V Under 500	39.0	35.4	49.2	60.4	49.2	64.4
Per Cent Distribution						
Total Enrollment						
SAT-V 600+	29.0	29.0	29.0	24.7	29.0	23.2
SAT-V 500 - 600	41.0	41.0	41.0	38.5	41.0	37.6
SAT-V Under 500	30.0	30.0	30.0	36.8	30.0	39.3

Source: See Table 8.

TABLE 20

IMPACT OF HYPOTHETICAL INCREASE OF PUBLIC ENROLLMENT ON PRIVATE SCHOOLS, 1985

(FTE degree credit students in thousands)

	Category				
	1	2	3	4	Total
Public New Enrollment	20	300	1,900	2,290	4,580
Difference from Projection	8	37	409	-	324
Impact on Private Sector	-	293	94	137	524
		(-56%)	(-59%)	(-56%)	(-48%)
Impact by SAT					
Over 600					63 (-29%)
500 - 600					179 (-45%)
Under 500					282 (-50%)

Source: Table 8.

TABLE 21

POSSIBLE IMPACT OF LOWERING OF OUT-OF-STATE TUITION ON PRIVATE REGIONAL SCHOOLS, 1985

MEAN COMBINED SAT SCORES	Losses	Per Cent of Projected Enrollment
1,100 - 1,199	30	21.1
1,000 - 1,099	38	20.1
900 - 999	26	18.4
Less Than 900	9	20.9
Total	103	20.0

Source: HEGIS Surveys and text.

TABLE 22

PROPORTION OF ENROLLED FRESHMEN WITH SAT-VERBAL SCORES BELOW 500 BY SELECTIVITY GROUP, 1970

(per cent of enrolled freshmen)

MEAN COMBINED SAT SCORE 1,300+	
Group 1	
Bryn Mawr College	0.9
Williams College	3.9
St. John's College (Md.)	0.9
Rice University	3.4
Smith College	3.5
Amherst College	5.9
Total	3.5
Group 2	
Middlebury College	8.3
Bucknell University	7.9
Kenyon College	7.3
Reed College	5.3
Total	7.4
Group 3	
Lafayette College	9.5
Union College	10.5
Carleton College	9.4
University of Rochester	10.7
Washington University	14.0
Georgetown University	13.0
Pomona College	11.2
Davidson College	11.9
Total	11.7

TABLE 22 (Cont'd)

PROPORTION OF ENROLLED FRESHMEN WITH SAT-VERBAL SCORES BELOW 500 BY SELECTIVITY GROUP, 1970

(per cent of enrolled freshmen)

MEAN COMBINED SAT SCORE 1,100 - 1,199	
Group 1	
Connecticut College	6.0
Wells College	18.8
Washington and Lee University	16.0
Allegheny College	16.1
St. Lawrence University	15.5
Wheaton College (Mass.)	19.4
Pitzer College	19.5
Total	15.3
Group 2	
George Washington University	31.5
Florida Presbyterian College	20.1
Boston College	30.7
College of the Holy Cross	25.6
Macalester College	20.1
Ithaca College	40.1
Le Moyne College	35.5
Syracuse University	33.4
Albright College	32.4
Gettysburg College	28.2
University of North Carolina (Chapel Hill)	33.2
Furman University	30.2
Drexel University	36.9
Fordham University	34.0
Total	32.3

Source: See Table 7.

TABLE 23

POSSIBLE EXPANSION OF FRESHMAN CLASS THROUGH LOWERING OF ADMISSION STANDARDS, BY SELECTIVITY, PROPORTION OF STUDENTS WITH AVERAGE VERBAL SAT BELOW 500, AND INSTITUTION

(per cent increase in enrollments based on 1970 data*)

MEAN COMBINED SAT SCORE 1,200+	
Group 1	
Bryn Mawr College	49.1
Williams College	39.8
St. John's College (Md.)	17.3
Rice University	27.2
Smith College	39.4
Amherst College	8.1
Total	31.8
Group 2	
Middlebury College	20.9
Bucknell University	26.6
Kenyon College	13.9
Reed College	8.0
Total	19.4
Group 3	
Lafayette College	27.4
Union College	12.7
Carleton College	10.0
University of Rochester	8.3
Washington University	5.8
Georgetown University	8.7
Pomona College	12.2
Davidson College	10.6
Total	10.7

TABLE 23 (Cont'd)

POSSIBLE EXPANSION OF FRESHMAN CLASS THROUGH LOWERING OF ADMISSION STANDARDS, BY SELECTIVITY, PROPORTION OF STUDENTS WITH AVERAGE VERBAL SAT BELOW 500, AND INSTITUTION

(per cent increase in enrollments based on 1970 data*)

MEAN COMBINED SAT SCORE 1,100 - 1,199	
Group 1	
Connecticut College	12.7
Wells College	4.0
Washington and Lee University	19.1
Allegheny College	16.9
St. Lawrence University	11.5
Wheaton College (Mass.)	8.3
Pitzer College	25.8
Total	14.0
Group 2	
George Washington University	11.1
Florida Presbyterian College	11.1
Boston College	7.9
College of the Holy Cross	18.9
Macalester College	14.3
Ithaca College	22.1
Le Moyne College	10.9
Syracuse University	13.0
Albright College	24.0
Gettysburg College	59.3
University of North Carolina (Chapel Hill)	7.9
Furman University	16.7
Drexel University	30.7
Fordham University	15.5
Total	15.8

TABLE 23 (Cont'd)

POSSIBLE EXPANSION OF FRESHMAN CLASS THROUGH LOWERING OF ADMISSION STANDARDS, BY SELECTIVITY, PROPORTION OF STUDENTS WITH AVERAGE VERBAL SAT BELOW 500, AND INSTITUTION

(per cent increase in enrollments based on 1970 data*)

* Figures were derived in the following manner: it was assumed that students with lower verbal SAT scores would be accepted at the same rate as all those who applied. In groups one and two of the highest selectivity institutions, this rate was applied to all candidates with SAT-V scores below 600 and 550 respectively, and in all other groups, the cut-off was set at SAT-V of 500. The difference between actual and potential enrollments is expressed in percentage of freshman class.

Source: See Table 7.

TABLE 24

HYPOTHETICAL BUDGETS OF SCHOOLS

		Schools Covering 60 Per Cent of Undergraduate Cost Through Tuition			
		Enrollment 100	Enrollment 80	Enrollment 90	
					Rebate 50%
Expense:	Fixed	40	40	-	-
	Instruction	60	49	-	-
		100	89	-	-
Revenue:	Tuition	60	48	-	-
	Other	40	40	-	-
		100	88	-	-
Expense:	Fixed	40	40	40	-
	Instruction	60	49	57	-
		100	89	97	-
Revenue:	Tuition	90	72	81	77
	Other	10	10	10	10
		100	82	91	87
Deficit:		0	7	6	10

Source: See text.

TABLE 25

UNDERGRADUATE ENROLLMENT TRENDS IN THE PUBLIC SECTOR, MAJOR STATE UNIVERSITIES AND ALL PUBLIC INSTITUTIONS, 1970-73

(full-time equivalent undergraduate students in thousands)

	1970	1973	Ratio 1970/1973
Major State Universities	858	907	1.056
All Public Institutions	3,908	4,106	1.051

Source: Special tabulations, HEGIS Surveys V and VIII (1970, 1973).